TOXICITY RELATIONAL DATABASE SYSTEM TOXDATA

VERSION 2.0

USER'S MANUAL

MAY 1989

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Environment Ontario

Jim Bradley
Minister

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TOXICITY RELATIONAL DATABASE SYSTEM

TOXDATA

VERSION 2.0

USER'S MANUAL

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MAY 1989

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Introduction

The Ontario Ministry of the Environment initiative called MISA (Municipal Industrial Strategy for Abatement) will rely heavily on biological assessment procedures in addition to chemical/physical ones. MISA is a renewed effort to improve water quality in the province through controlling toxic substances discharged into surface waters. This will be accomplished, in part, through requirements of dischargers to install the best treatment that is available for their industry and is reasonably achievable economically (BATEA). It will also be accomplished through additional controls, where required, based on site-specific receiving water considerations. Biological assessment forms a fundamental part of both these complimentary approaches to controlling discharges.

As a result of these new initiatives, many dischargers will be required to monitor their effluent quality by collecting samples and determining the relative acute toxicity. Acute toxicity is determined by conducting a static 96 hour LC50 fish toxicity test and a static 48 hour LC50 *Daphnia* toxicity test, both done in accordance to Ministry protocol. The information collected will be used to formulate effluent limits regulations.

Due to the large amount of data that will be generated, the monitoring regulations stipulate electronic transfer of data from dischargers to the Ministry of the Environment. The electronic transfer of data will prevent introduction of data entry errors into stored data, as well as decreasing the need for re-entry.

To facilitate the management of effluent toxicity data, a relational database program, TOXDATA, has been developed. This will allow industry along with the Ministry and contract laboratories to store and exchange toxicity data. Program options provide users with the ability to query for data based on user defined keys, develop and print hardcopy reports, maintain data files, prepare log files, and provide security access to sensitive operations.

The TOXDATA system is written in dBASE III PLUS and subsequently compiled with Foxbase+ Compiler. The executable code is available free of charge from the Ministry and operational on any MS-DOS compatible personal computer. This manual describes in detail the necessary hardware requirements, the installation procedure and all system functions. Disks supplied with this manual provide all the software required to run TOXDATA. The Ministry of Environment provides the program and manual on an "as is" basis and will not assume responsibility for any indirect or consequential damages.

Hardware Requirements

The minimum requirements to run TOXDATA are:

- IBM XT, AT or fully compatible micro-computer with a minimum of 640 K memory
- MS or PC DOS operating system
- printer (preferably with a wide carriage)
- monitor (EGA colour supported but not essential)
- at least two double sided diskette drives (hard drive recommended)

Although it is theoretically possible to run TOXDATA with only two double sided diskette drives, users would find operating a database under these conditions very limiting. The amount of data stored is limited by the capacity of the storage media therefore a computer equipped with a hard disk data storage is strongly recommended. Installation of TOXDATA is dependant on the hardware configuration. Please refer to Installation Procedures.

While it is possible to enter data into a PC not equipped with a printer, the printer is required to produce a Toxicity Report and Transmittal form. TOXDATA will support most types of printers (except a laser printer).

The electronic data as required by the regulation consists of a copy of output transactions to be submitted on a floppy diskette. The diskette must be a good quality 5 1/4" diskette, MS or PC DOS formatted, 48 tracks per inch, 9 sector, double sided, and double density (360K).

Chapter 1 - Installation Procedure

Before you can run your TOXDATA program you must first install it on your system . The following is a step by step explanation of the Installation Procedure:

First make sure that the CONFIG.SYS file exists on the floppy/hard disk. If this file does not exist you must create it. This can be done by using the DOS program called EDLIN.EXE (refer to the DOS Reference Manual on how to operate the EDLIN program). You must make sure that the CONFIG.SYS file contains the following two lines:

BUFFERS = 15

FILES = 20

After making sure that your CONFIG.SYS file exists and it contains the above two lines of code, you may continue with the rest of the installation.

1.1 Installation for a Hard Drive Configuration

Step 1 - Create a new directory on your hard drive. Type the following command:

C > **MD\TOXDATA** < ENTER >

Now that you have made a new directory called TOXDATA you must now change from the root directory (C>) to your new directory (C:\TOXDATA>). Enter the following command:

C > **CD\TOXDATA** < ENTER >

Your prompt should now read C:\TOXDATA> or C>, depending on what your prompt was originally set at. If you wish to have your prompt tell you which directory you are in type the following command: [OPTIONAL]

C > **PROMPT PG** < ENTER >

Now you are ready to copy the TOXDATA disks to your hard drive. Place the disk labled FOXPRUN into disk drive A. Type:

C > **COPY A:*.*** < ENTER >

Remove the FOXPRUN disk from drive A and place the disk labled TOXDATA into drive A. Type:

C > **COPY A:*.*** < ENTER >

Step 2 - Now you can put the FOXPRUN and TOXDATA disks in a safe place. They are no longer needed to operate the TOXDATA program. These can now be used for backup purposes. You are now ready to run the INSTALL program. Type the following command:

C:\TOXDATA > **FOXPRUN INSTALL** < ENTER >

The INSTALL program will ask you to enter the configuration of your system. A screen should appear that tells you what information the installation process will be asking you to enter. Proceed to step three (in subsection 1.2).

1.2 Dual Floppy Drive Configuration

Step 1 - You should first make a backup copy of the **FOXPRUN** and **TOXDATA** disks for safety purposes. Make sure you you have two formated disks ready before you continue. Place the Foxprun disk in drive A and a blank formated disk in drive B and type:

A> **COPY A:*.* B:** <ENTER>

After the files have been copied, remove the Foxprun disks from both drive A and B. Now place the Toxdata disk in drive A and a blank formated disk in drive B and repeat Step 1.

Place the two original disks in a safe place for storage and be sure to lable your two new disks.

Step 2 - Now you are ready to run the install program. Place the FOXPRUN disk in drive A and your TOXDATA disk in drive B. Type:

A> **FOXPRUN INSTALL** <ENTER>

Proceed to Step 3.

Step 3 - **This step applies for both configuration types.**

You will be asked if you wish to continue with the install program. You should type **Y** if this is the first time you are running the INSTALL progam. If this is not the first time installing the TOXDATA program type **N** if you do not wish to change the system configuration.

The screen will clear and then ask you to answer 7 questions. These questions are:

Which disk drive will be holding the Foxprun program?
Which disk drive will contain the TOXDATA program?
Which drive will hold the databases and indexes?
Which drive will hold the log files?
Which floppy drive will be used for the Sample Info. dump?
Is there a printer? (Y/N)
Input your Company name and address?

The answers to these questions will be used to determine where the TOXDATA program should find the information it needs to operate properly.

When answering the questions, enter the drive letter where the information is stored. When entering the User Information (Company name and address) the first line is for the Company name and the next 4 lines are for the address.

After you have answered the installation questions you will be able to verify the information and save it or you can abandon the installation program. If you enter **Y** the program will save the information to an INSTALL.MEM file, if you have made an entry error you should enter **N** and run the INSTALL program again.

The INSTALL.MEM file holds what drives the TOXDATA program should access to find the databases/indexes, where to write the sample dump to disk, etc.

When you run the TOXDATA program you will be asked to enter in the drive letter where the INSTALL.MEM file is located.

Your TOXDATA program is now installed for your hardware configuration.

1.3 Getting Started

Select option 1 from system main menu and enter **SYSTEM MANAGER** for the identification name and **MOE** for the password. After you are logged on the system go directly into the Security File Maintenance option (19). You should now change the ID name and password to ensure database security. When finished, add new users to the file by entering their ID name, password, and their assigned clearance code (System manager, Read only, Write/read). Refer to Chapter 3 section 3.19 for a more detailed explaination of this option.

The TOXDATA program once installed does not contain any data, but will require data for the following files before bioassay test data can be entered: (1) Discharger file; (2) Pipe file; (3) Parameter and (4) Testcode file. If this program is to be used for managing data generated by the MISA monitoring regulations, it is important and a requirement to use the proper Ministry of the Environment codes for certain fields in the Discharger ,Pipe, Parameter and Testcode files. These include the fields called MISA and Pipe code. Please contact Aquatic Toxicity Unit (416) 235-5792 to obtain the data for these fields corresponding to each company and their associated discharge points. Data for Parameter and Testcode file can be found in Appendix D.

After this data has been entered you may then start entering Sample data.

Chapter 2 - Overview

2.1 LOGING ON/OFF TOXDATA SYSTEM

2.1.1 Logging on

To start the TOXDATA system , type :

C>**CD\TOXDATA** <ENTER>

then type :

C>**TOXDATA** <ENTER>

From the system menu you can only do the following operations: (1) *Log onto system;* or (2) *Exit*

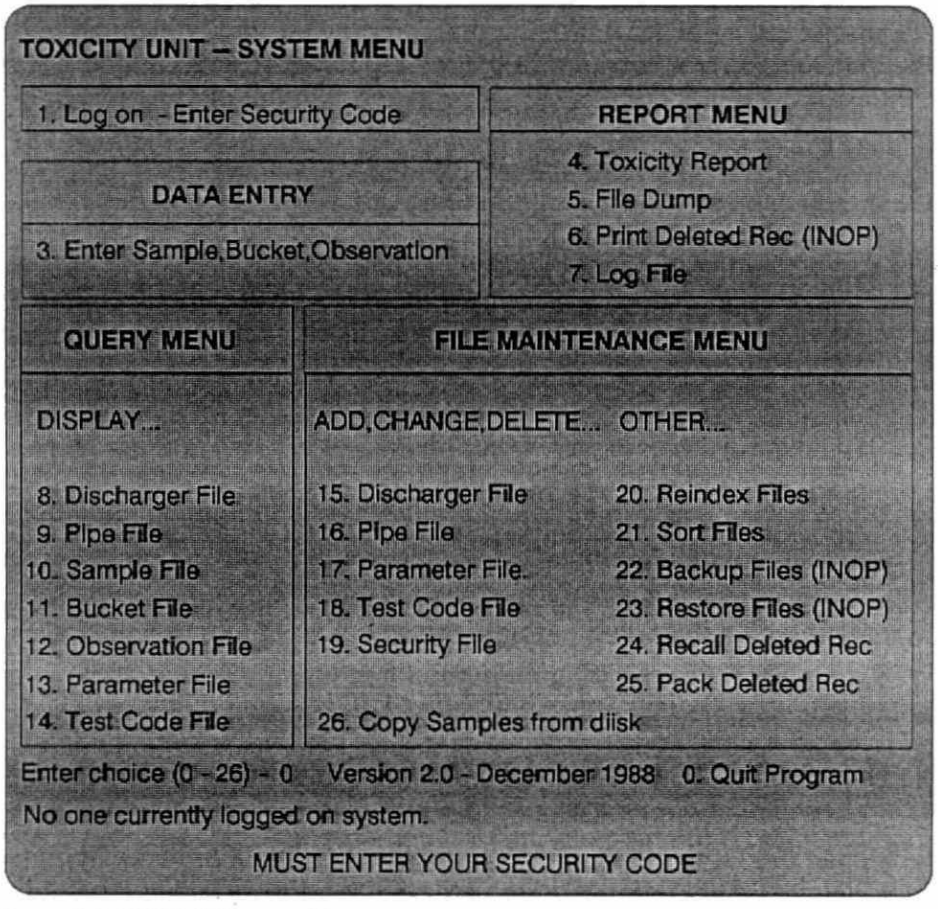


Figure 1: TOXDATA Log-on Menu

the program. Once you have logged onto the system the rest of the operations are available for you to use (depending on your security clearance).

When you select Option number 1 (Log on - Enter Security Code), you are asked to enter your **IDNAME** and **PASSWORD**. This is done so that the System Manager can identify your logfile.

The following are the security clearances available:

Clearance Code	Limitations
S	System Manager - all operations available
W	Write - allowed to enter/view informations
R	Read - allowed only to view information

Your **LOGFILE** is a text-file which contains a listing of everything you have done while you were on the system.

2.1.2 Logging off

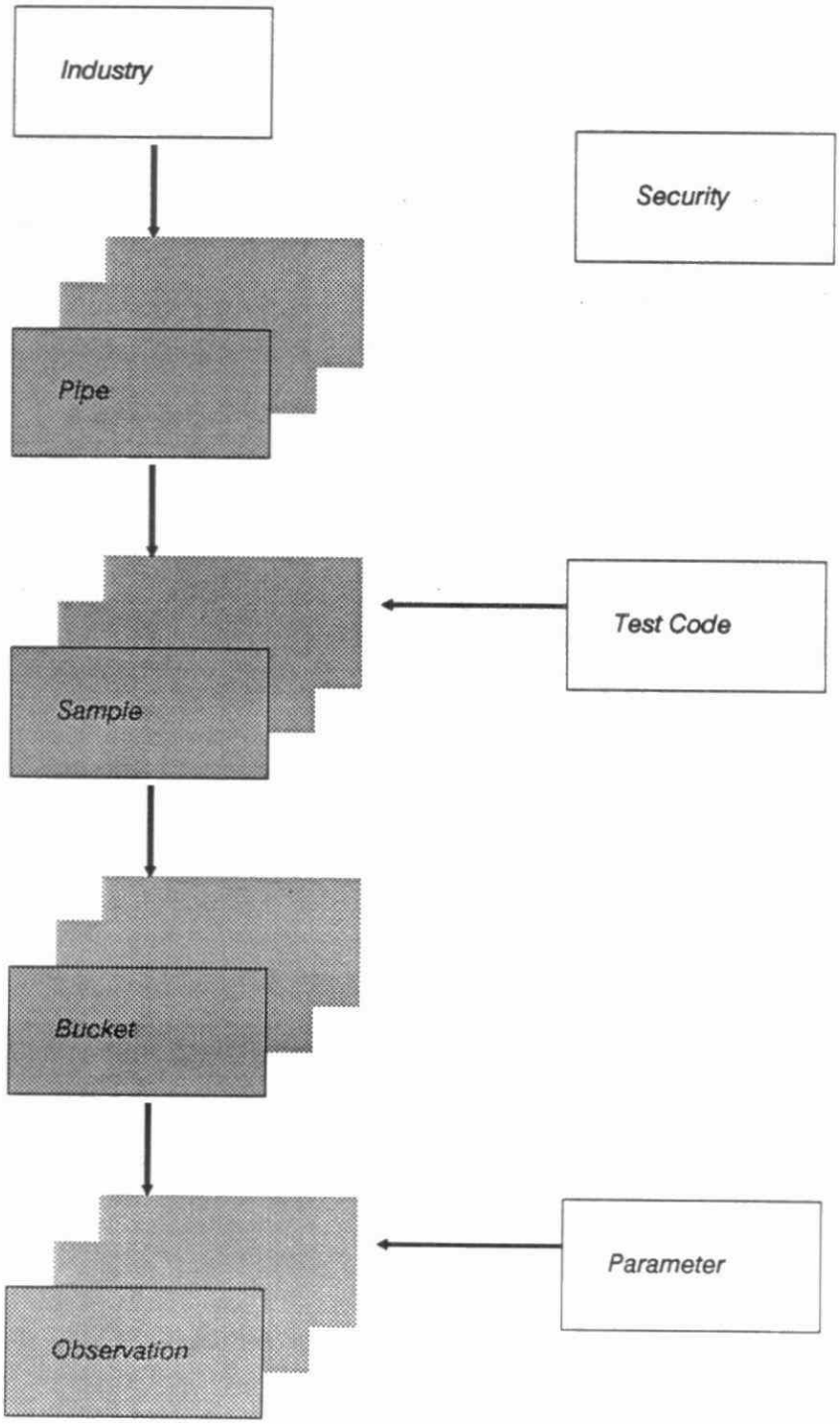
After you have logged on the system, Option number one changes to Option number two (Log off - Clear Security Code). Choosing this option allows you to log off the system and close off your logfile for future printing.

2.2 FILE STRUCTURES

TOXDATA is a relational database program using a "one to many" pyramid design. Of the eight different files used in the program, five are in a hierarchial chain while the other three are used as "look-up" files. A diagram of the relationships can be found on the following page. At the top of the pyramid structure is the INDUSTRY file which contains information describing the name, location and industry sector of particular companys. The second file called PIPE identifies all discharge points per company (control points) and contains information on the discharge locations for each company. The following files called SAMPLE, BUCKET and OBSERVATION contain information derived from bioassay testing of effluent samples. For every Industry there can be more than one pipe. For every Pipe there can be more than one sample and for every Sample there are more than one buckets (concentration of effluent). And for every Bucket there are one or more observations. From top to bottom in the pyramid file structure, the number of records per file will increase. The file called SECURITY contains information allowing users different data management capabilities. The file TESTCODE contains information on the type of biological testing (ie. *Daphnia*, and fish acute lethality bioassays). And the PARAMETER file contains information describing the parameter of measurement (ie. parameter 3 refers to dissolved oxygen, measured in mg/L). Please refer to Appendix A for a listing of the fields, including character length and type for all the database files and Appendix B for the fields in each file and also description of each field.

The systems data files are standard dBASE III "dbf" files therefore users familiar with dBASE will be able to manipulate them outside of the TOXDATA system. This is usefull allowing ease in creating new style reports or merging with other databases. A word of caution to the novice who is not familiar with dBASE. Inproper manipulation and indexing may damage files for use in the TOXDATA system.

DIAGRAM OF HOW THE TOXDATA DATABASES ARE RELATED



2.3 DATA ENTRY OPTION

2.3.1 Entering Sample Data

This option allows you to enter Sample Data for a specific Discharger and Pipe. You are first asked to enter in Discharger's **Company name** and **Location**. Once this is displayed, you are asked to enter the **Control point.** Now you are ready to enter the unique sample code and its corresponding data.

Each Sample will consist of upto ten Buckets and a maximum of ten Observations per Bucket. A bucket is entered by selecting the **ADD A BUCKET** option from the edit sample menu. An observation can be entered by selecting the option **ADD OBSERVATION** from the edit bucket menu.

2.4 REPORT MENU OPTIONS

2.4.1 Toxicity Report

By selecting option **four** (Toxicity Report) from the TOXDATA System Menu, you will be able to produce a toxicity report, for a specific sample. This also produces a transmittal form which is required under the MISA regulations. See Appendix E for an example of the report.

2.4.2 File Dumps

Selecting option **five**, under Report Menu, will allow the user to generate hardcopy and diskette reports based on user defined search keys. After selecting which file you will be dumping to printer/disk appropriate sub-menus will prompt you for more specific requests.

2.4.3 Printing Deleted Records

When wishing for a hardcopy printout of deleted records in a file, you will select this option (**Print Deleted Records**). The deleted records of the specified file will be printed in a report for the System Manager to verify.

2.4.4 Log File

Option **seven** (Log File) under the sub-menu REPORT MENU will allow the user to produce a hardcopy of specific log files. Log files are extremely important to the System Manager to evaluate the number of transactions completed on the system and to assist in recovery from system failures. All transactions are transparantly recorded during a user's session and are saved in a **LOG FILE**. An example of a log file hardcopy can be found in Appendix E. Log Files should be deleted or archived periodically to free **valuable** space.

2.5 QUERY MENU OPTIONS

2.5.1 Discharger File

By selecting option number eight from the system menu you can view information on a particular company within the Discharger File. This allows the user to view all fields for the record selected, including an option to view two memo fields.

There is also an option to view a summary of all the samples done for the company. This query can be aborted at any time by the user.

2.5.2 Pipe File

By selecting a company from the discharger file and then selecting a control point (pipe code), you can view information regarding the effluent selected. This is option nine on the system menu.

2.5.3 Sample File

Option ten is to query the Sample file. This allows the user to view all the sample file fields for the sample requested. Company and control point must be entered in order to view the sample.

2.5.4 Bucket File

This allows the user to view the data for a specific bucket. A sample consists of a maximum of ten buckets with each having a different level of concentration. Buckets are represented by a letter between **A** and **J**.

2.5.5 Observation File

By selecting option twelve the user may view the parameter data for a specific observation. An observation is a recording of the parameters on a set day and time.

2.5.6 Parameter File

This option allows the user to view the description of a certain parameter which is found in the Parameter file. An example might be to view the description of parameter code #1.

2.5.7 Testcode File

The different types of tests may be viewed by selecting option number fourteen. The user will see the information for a specific testcode displayed on the screen.

2.6 FILE MAINTENANCE MENU OPTIONS

This menu is very important when first setting up your system. Options 15 through 19 must first be entered before any effluent sample bioassay data can be entered into the databases.

2.6.1 Discharger File

When this option is selected it lets the user enter in the information pertaining to the company they are entering or editing.

2.6.2 Pipe File

This allows the user to input the information regarding the control point (pipe code) which was specified. The user is able to add new control points as well as edit existing ones.

2.6.3 Parameter File

This sub-program allows the user to add new parameters to the file or to edit any existing parameters.

2.6.4 Test Code File

When this option is selected the user is able to edit existing testcodes or to add any new testcodes there might be.

2.6.5 Security File

This option is for the system manager(s) so that they can add, edit or delete any of the system users from the security file.

2.6.6 Reindex Files

This allows the user to reindex any or all of the files used by the TOXDATA program.

2.6.7 Sort Files

This allows the user to sort any or all of the files. After the sort has been completed, the files will then be reindexed automatically. This is done so that the indexes match with the newly sorted files.

2.6.8 Backup Files

This will allow the user to make backups of the databases and their indexes.

2.6.9 Restore Files

This will take the backups of the databases and restore them onto your disk.

2.6.10 Recall Deleted Records

Human errors will occur, this allows the system manager to recall any deleted records that should not have been deleted.

2.6.11 Pack Deleted Records

This allows the system manager to delete records that are marked for deletion so that there is more disk space for adding data to the databases. Disk space is very important.

2.6.12 Copy Samples from Disk

This option allows the user to copy sample data, which was dumped to disk, back into the databases.

Chapter 3 - Program Operation

3.1 Starting TOXDATA

After having installed the TOXDATA program all you need to do in order to run the program is type (if you are using a hard disk drive):

C>CD>TOXDATA

C> TOXDATA <ENTER>

If you are not using a hard disk drive you must make sure that the Toxdata program disk is in drive **A** and the Foxprun disk is in drive **B**. Then type (from the A> prompt):

A> B:FOXPRUN TOXDATA <ENTER>

Note: When using a system without a hard disk drive you must make sure that the Foxprun overlay files are always on the disk in drive **B**. When doing a file dump to floppy disk, make sure the disk you are going to use is already formatted and contains these overlay files (**FOXPRUN.OVL FOXPRUN.OV2**). These files are needed by the Foxprun disk in order to run the Toxdata program sucessfully. The files can be found on the FOXPRUN disk.

If the TOXDATA program has been loaded and run successfully, the following screen will appear:

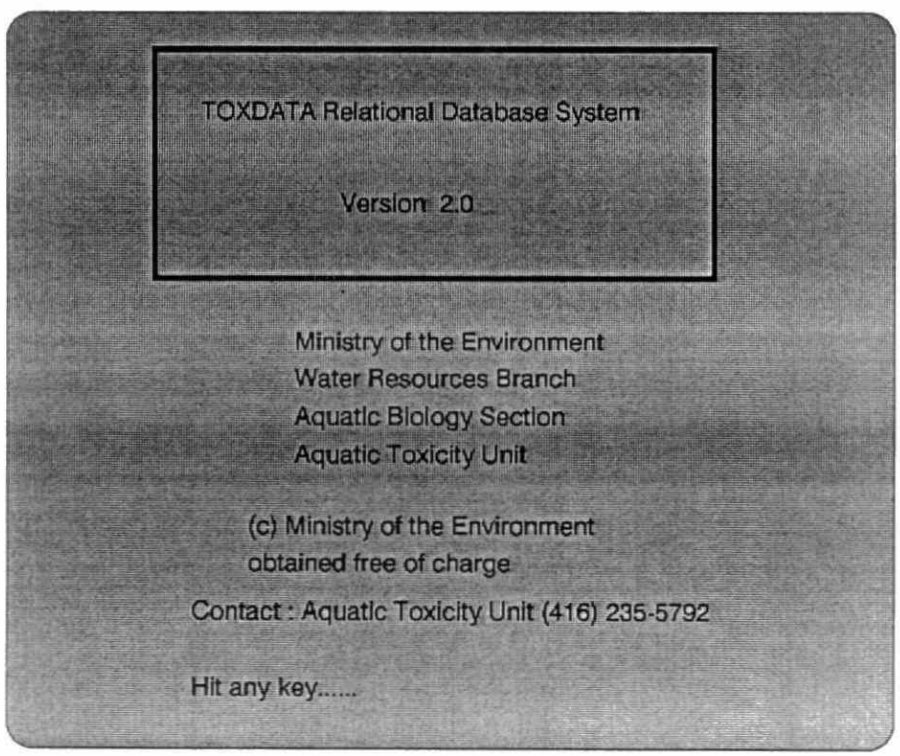


Figure 2: TOXDATA Title Screen

By depressing any key (except **ESC**) you may continue with the program. The main System Menu should now appear on the screen (**see Figure 1 - page 3**).

In order to perform one of the menu options listed you must first log onto the system.

3.2 Logging on System

After choosing option **one** from the System Menu you will be prompted to enter your ID NAME which is given to you by the system manager. When entering your **ID NAME** it does not matter if the letters are in lowercase or uppercase. You now will be asked to enter your **PASSWORD** (any sequence of 8 letters).

If your **ID NAME** is in the security file and you have entered the correct PASSWORD the following message will appear at the bottom of the screen:

ID NAME is currently logged on the system.

Once you are logged on the system option one is replaced by option two (**Log off - Clear Security Code**). You now are ready to begin your log-on session.

3.2 Logging off System

When logging off the system , select option 2. The system will name your logfile automatically.

After successfully logging off the system the initial System Menu (with option one) will appear on the screen.

3.3 Entering Sample Data

This option allows the user to add/edit/delete toxicological data to/from the databases. The below screen will appear after choosing the DATA ENTRY option. The computer prompts the user to enter the name of the company one wishes to add/edit data to. Entering the company name then a carriage return, will prompt the user to enter the company location. After entering the location, the system will verify your choice by displaying the company name, location and MISA code. When answering the prompt to enter the company name and location short forms may be entered. This usage will be dependent upon if the short form can uniquely identify the desired company and location. For example:

Company : **Raymondo Electronics** *may be entered as -* Company: **Ray**

Location : **Toronto** Location : **Tor**

The user is then prompted to enter the control point (code for location of discharge). Entering a "/" will list the possible control points and their description. Entering a "**<ENTER>**" will allow the user to enter a different company. After entering an existing control point, the user is prompted for a Sample Code. The identification of a particular sample is assigned by the Sample Code. Each

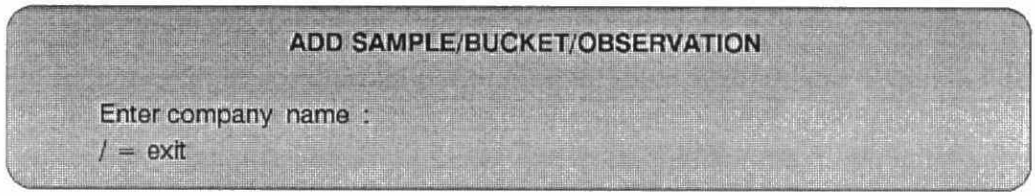


Figure 4: Data Entry option

new sample should be assigned a unique code. Sample codes can be alphabetic or numeric or a combination of both. Please refer to Appendix F for Sample code assignment if the program is to be used for MISA monitoring regulations.

The preceding data entry screen will be displayed after a unique sample code has been assigned. TOXDATA prompts for data entry. Data entry for a parameter is shown by the highlighted cursor. Normally, you enter DATA values into the first field followed by the second and so on until all fields are filled. The requested parameter entries are explained in Appendix B. For a list of the fields that must be entered to complete MISA requirements please refer to Appendix B.

Note : Substitute appropriate laboratory testing location ID in the LAB field (MOE is a default). Also, it is very important that the three date fields and the time field must be entered - there is an elapsed time calculation done using these fields.

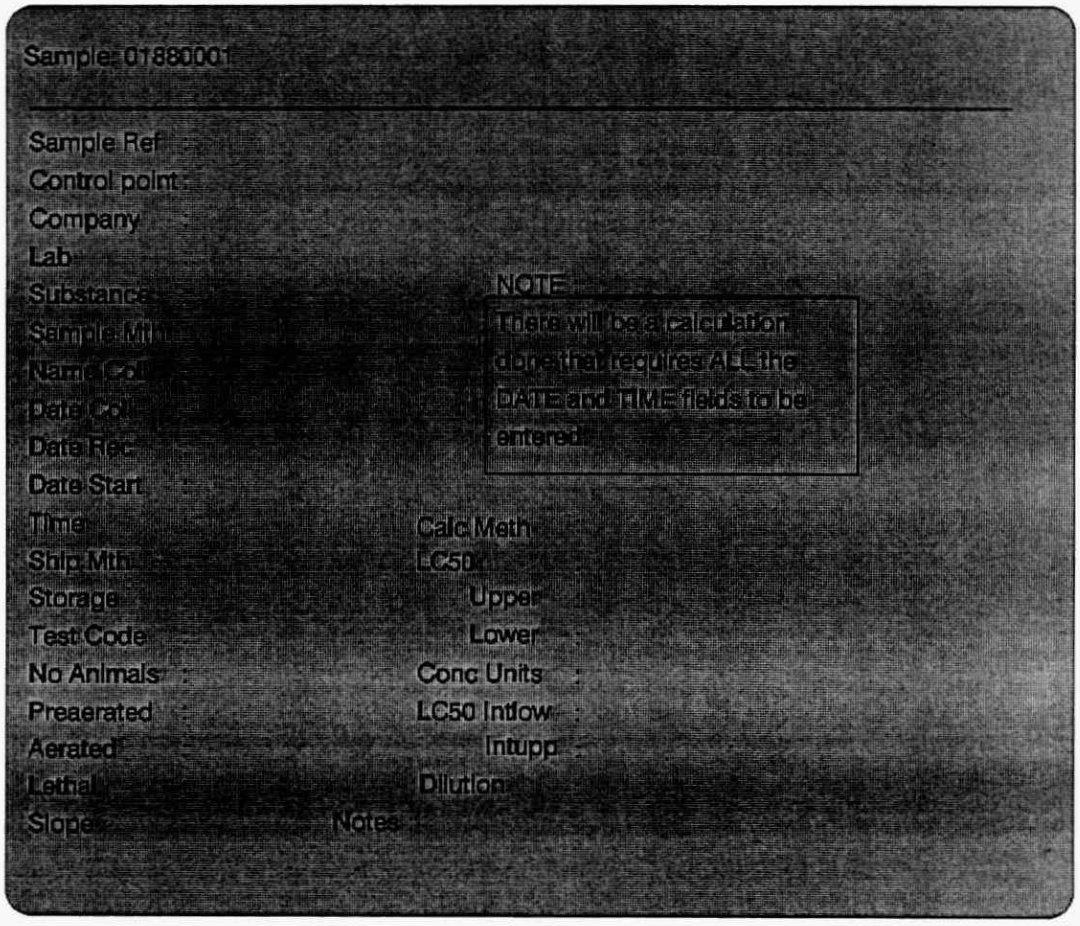


Figure 5: Sample entry screen

Once the last parameter field has been entered the following edit screen will appear.

The below data edit screen will be shown after a unique sample code has been entered. TOXDATA prompts the user to edit a field or add/edit related data (**Buckets, Observations**). At this point, data can be edited directly by selecting the desired parameter field number. For example, "**19**" will highlight the LC50 value and then allow you to edit the field. Option "**27**" will delete the Sample and all the buckets and observations for that sample. More information of the experiment are now requested, please select option "**28**" - Add Bkts. The "Add Bkt" routine of the program stores data on the number of concentrations, effluent concentrations and each concentration's LT50.

After selecting this option you will be asked to enter a **BUCKET CODE**. This code must be a letter

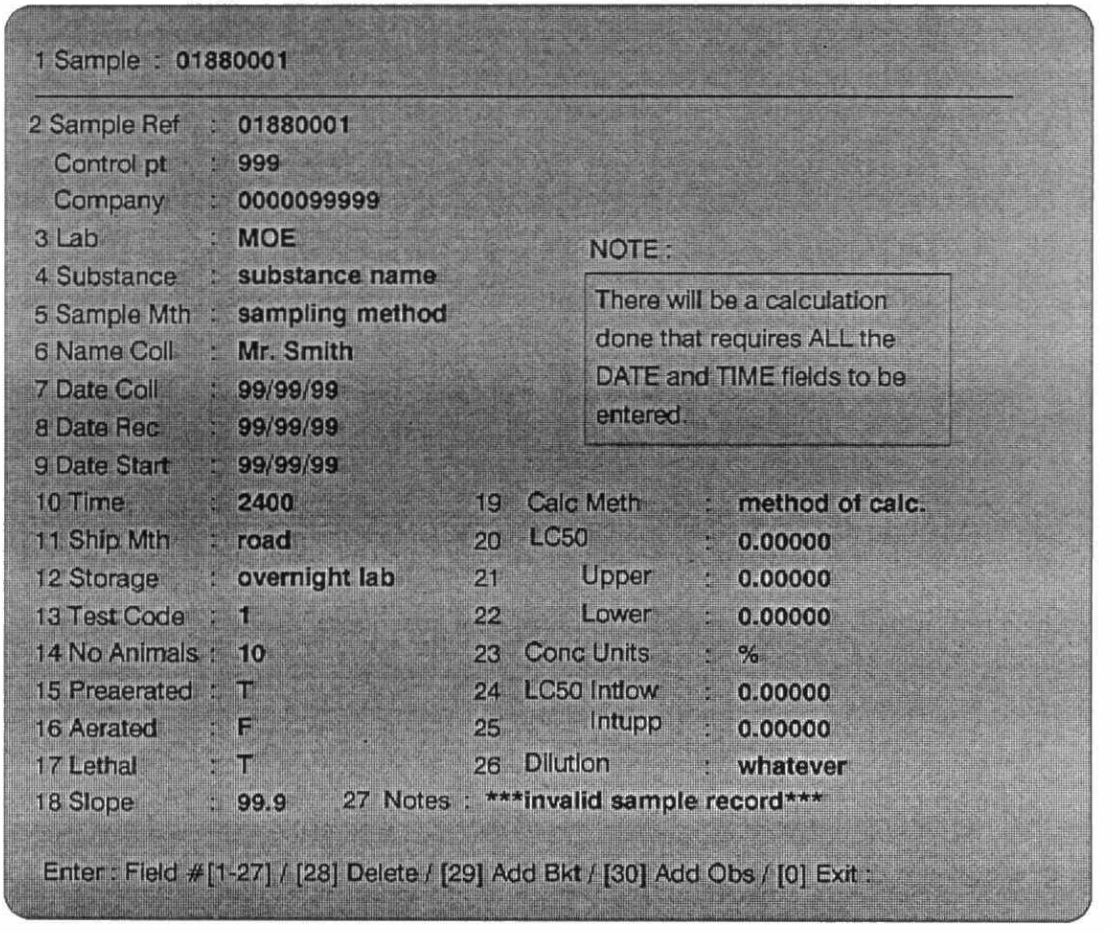

1 Sample : 01880001
2 Sample Ref : 01880001
Control pt : 999
Company : 0000099999
3 Lab : MOE
4 Substance : substance name
5 Sample Mth : sampling method
6 Name Coll : Mr. Smith
7 Date Coll : 99/99/99
8 Date Rec : 99/99/99
9 Date Start : 99/99/99
10 Time : 2400
11 Ship Mth : road
12 Storage : overnight lab
13 Test Code : 1
14 No Animals : 10
15 Preaerated : T
16 Aerated : F
17 Lethal : T
18 Slope : 99.9
27 Notes : ***invalid sample record***
NOTE :
There will be a calculation done that requires ALL the DATE and TIME fields to be entered.
19 Calc Meth : method of calc.
20 LC50 : 0.00000
21 Upper : 0.00000
22 Lower : 0.00000
23 Conc Units : %
24 LC50 Intlow : 0.00000
25 Intupp : 0.00000
26 Dilution : whatever
Enter : Field #[1-27] / [28] Delete / [29] Add Bkt / [30] Add Obs / [0] Exit :

Figure 6: Sample edit screen

between **A** and **J** (maximum of ten buckets). Each effluent concentration is assigned an arbitrary alphabet designator. The program is not concerned with the order of assignment. After entering the bucket code you will be prompted to enter in the following data: concentration, LT50 (upper and lower), Confidence (upper and lower). When entering the LT50 value -- if it has been calculated, please enter 95% confidence interval in parameter upper and lower. If it has not been calculated, please enter the time (24 hr clock) for 100% mortality in the field called upper and the

time for 0% mortality in the field called lower. Repeat this cycle until all the concentrations have been entered.

After all the data has been entered the edit screen below will appear, allowing you to edit the data. The edit works the same as it did for editing a sample. When everything is correct hit the **ENTER** key to exit back to the sample edit screen (Figure 6).

Now that the Buckets have been entered for the sample, it is time to enter in the observation(s) of the bioassay. This is done by selecting option 29 from the sample edit screen (Figure 6). The screen as in Figure 8 will appear. This screen will already be displaying the sample code, date, time, and all the concentrations (created in the "Add Bkt" routine) for the sample. At the bottom of the screen is a list of observation dates and their times of measurement which already exist. By

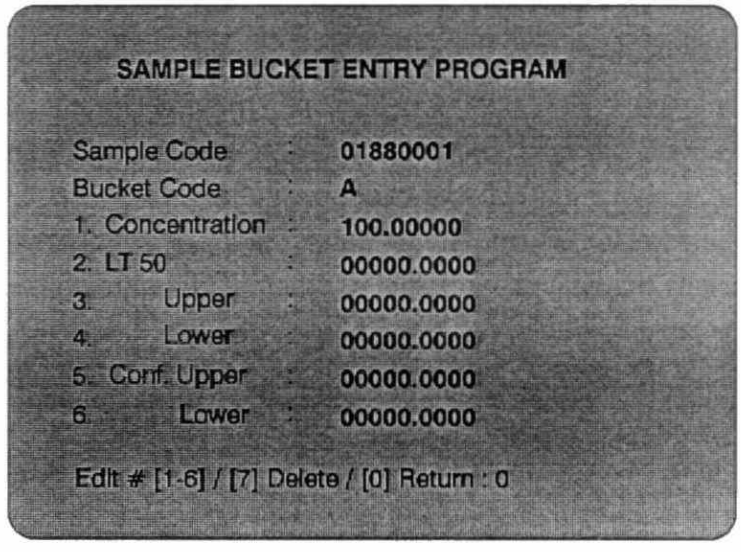

SAMPLE BUCKET ENTRY PROGRAM
Sample Code : 01880001
Bucket Code : A
1. Concentration : 100.00000
2. LT 50 : 00000.0000
3. Upper : 00000.0000
4. Lower : 00000.0000
5. Conf. Upper : 00000.0000
6. Lower : 00000.0000
Edit # [1-6] / [7] Delete / [0] Return : 0

Figure 7: Bucket edit screen

entering a date and time (**24 hr format**) you can either add new observations or edit existing ones. When editing an observation enter the bucket (**A to J**) and the parameter value to edit (1 to 5). Now you can change the value. To exit the edit mode, enter a "/". When you are finished entering/editing observations simply type "**XX**" for the date to return to the sample edit screen.

By entering "**MM**" or "**PP**" you can display the mortality data or parameter data for an observation. Figures 10 and 11 show examples of these screen layouts.

3.4 Toxicity Report

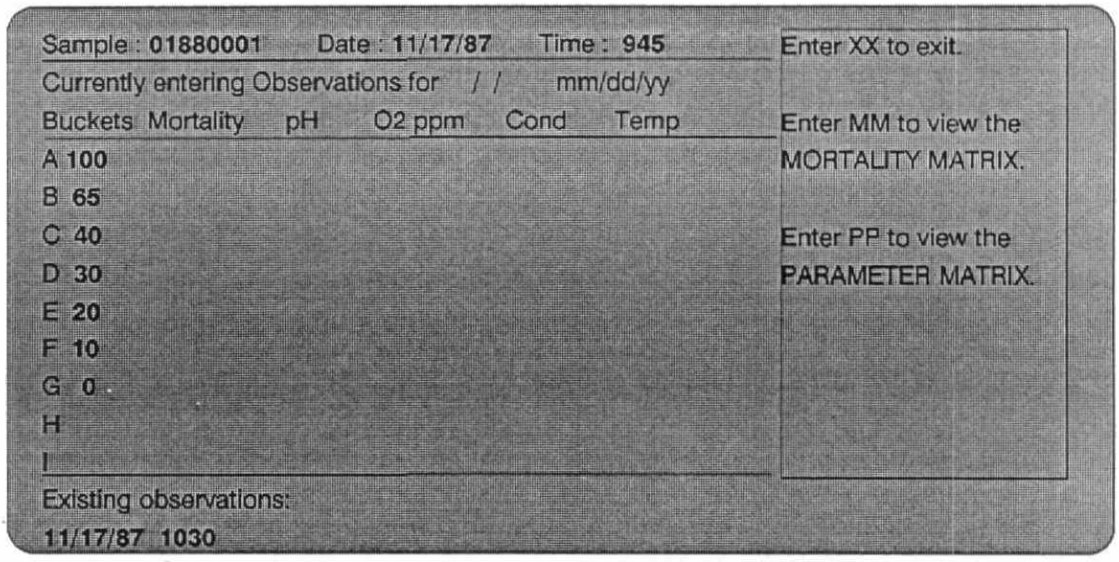


Figure 8: Add/Edit observation screen

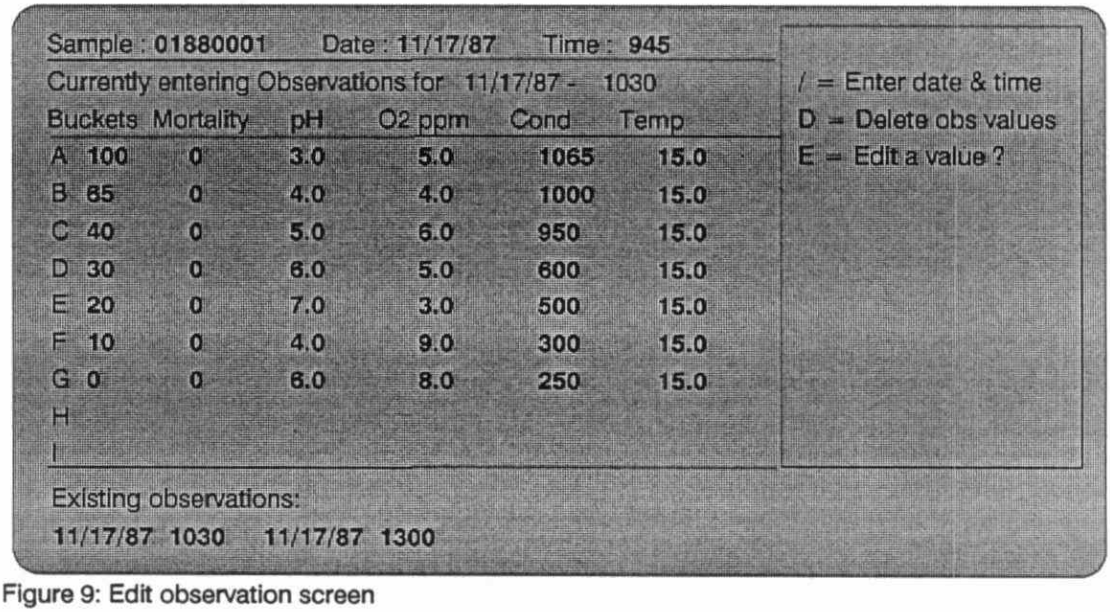

Sample : 01880001 Date : 11/17/87 Time : 945
Currently entering Observations for 11/17/87 - 1030
Buckets Mortality pH O2 ppm Cond Temp
A 100 0 3.0 5.0 1065 15.0
B 85 0 4.0 4.0 1000 15.0
C 40 0 5.0 6.0 950 15.0
D 30 0 6.0 5.0 600 15.0
E 20 0 7.0 3.0 500 15.0
F 10 0 4.0 9.0 300 15.0
G 0 0 6.0 8.0 250 15.0
H
I
Existing observations:
11/17/87 1030 11/17/87 1300
/ = Enter date & time
D = Delete obs values
E = Edit a value ?

Figure 9: Edit observation screen

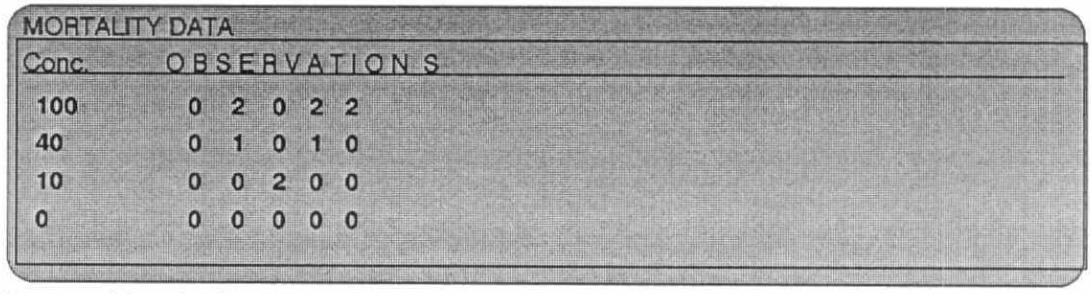


Figure 10: Mortality Matrix

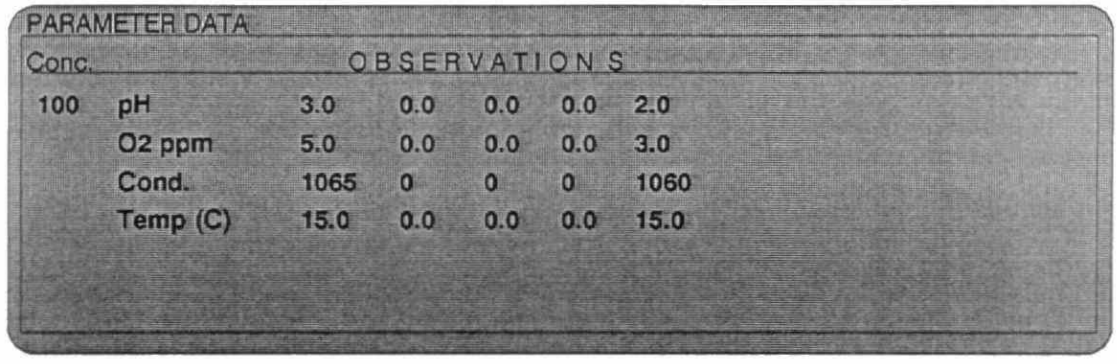


Figure 11: Parameter Matrix

Selecting option **4** on the System Menu, will allow users to generate the Toxicity Report and transmittal form as required under the MISA regulations. See Appendix E for an example of the report.

You will be asked to enter the Sample Code you wish to have printed. For a listing of possible sample codes for a particular company please refer to section 3.8 (Query Discharger File). Type in the sample code and hit **<ENTER>**. Now you'll see a message on the screen asking you if the Bucket and Observation files are to be sorted. Answer **Y** if there has been data added to these databases (or if you are not sure) since the last report was printed. Answer **N** if you do not want the files to be sorted or if you are printing another report immediately after the previous one.

To exit the Report generator hit **<ENTER>** when asked to enter a Sample Code.

3.5 File Dumps

Selecting option **5** under the Report Menu, will allow the user to generate hardcopy and diskette reports based on user defined keys. Under the reporting requirements of the MISA monitoring regulations data must be submitted to the ministry in hardcopy and electronic format. This option allows the user this ability.

This menu (Figure 12) prompts the user to select which data file the report will be generated from.

Note : options containing an * are <u>not</u> included in program Version 2.0.

Please select option **3** (Sample File) to generate diskettes as required by MISA regulations. Figure 13 will now appear in place of sub-menu #1. Option **1** on this menu will allow the user to print a

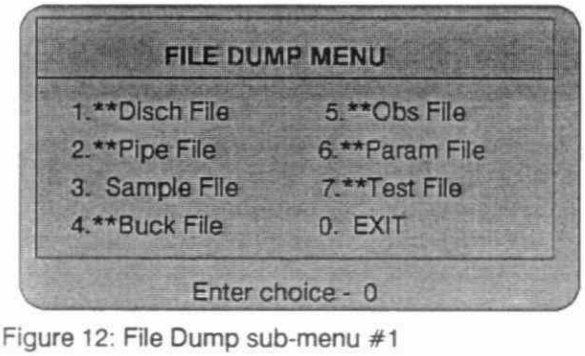


Figure 12: File Dump sub-menu #1

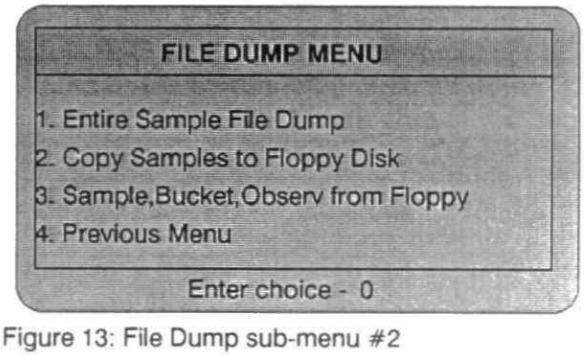

FILE DUMP MENU
1. Entire Sample File Dump
2. Copy Samples to Floppy Disk
3. Sample,Bucket,Observ from Floppy
4. Previous Menu
Enter choice - 0

Figure 13: File Dump sub-menu #2

summary of the entire sample file. Option **2** will select the program to allow the user to define a query and copy the selected data to floppy

diskette. Select this option for making the MISA regulation disk. Option **3** will print a hardcopy of the data copied to floppy diskette.

Selecting option **2** - Copy Sample to Floppy Disk, will now prompt for the user to enter the information to select the data from the databases. Please enter a date for the beginning of the period of the search to be made. Dates are entered **month/day/year**. The system will now prompt the user to enter the last day for the period of the search to be made. The user is now prompted to enter the company identification to be searched upon. Please enter the company MISA code. The system will acknowledge the defined parameters and request the user to place a formatted disk into the drive specified, in the installation procedure, for doing sample dumps. If the inserted disk contains the database structures, answer **Y**, if not answer **N** and the structures will be copied to the floppy disk. The system will begin the search and also copy the data onto the disk. Once completed the system will prompt the user to hit any key to continue.

To verify that the data copied onto the disk is correct, the user can select option 3 (Figure 13) to produce a hardcopy of the data transferred.

To exit from the File Dump Menu hit **<ENTER>** once or twice depending which sub-menu you are at.

3.6 Print Deleted Records

Not implemented in Version 2.0.

3.7 Log File

Option **7** - Log File under the sub-menu Report Menu will allow the user to produce a hardcopy of log files. Log files are extremely important to the system manager to evaluate the amount of transactions completed on the system. All transactions are transparantly recorded during a user's session and are saved on the log file. An example of a log file hardcopy is placed in Appendix E. Log files should be deleted or archived periodically to free valuable space if you are using a hard disk system.

By entering a "/" you can display the names of all the log files that exist. To print a log file align the printer paper and enter the log file name. To exit hit the **<ENTER>** key.

3.8 Query Discharger File

The user is prompted, after selecting option **8**, to enter in the company name and location. If the company is in the Discharger database, information on that company will appear on the screen.

The screen below (Figure 14) layout appears and waits for the user to enter one of the character commands on the bottom line of the screen.

By entering "**N**" any notes on the company will be displayed to the screen. To return to the screen hit any key.

"**S**" will show any Summary notes for that company and then wait for you to enter any key to return to the screen.

The "**V**" command will display all the existing samples for that particular industry (Figure 15). When this query is completed you are asked to hit any key to continue.

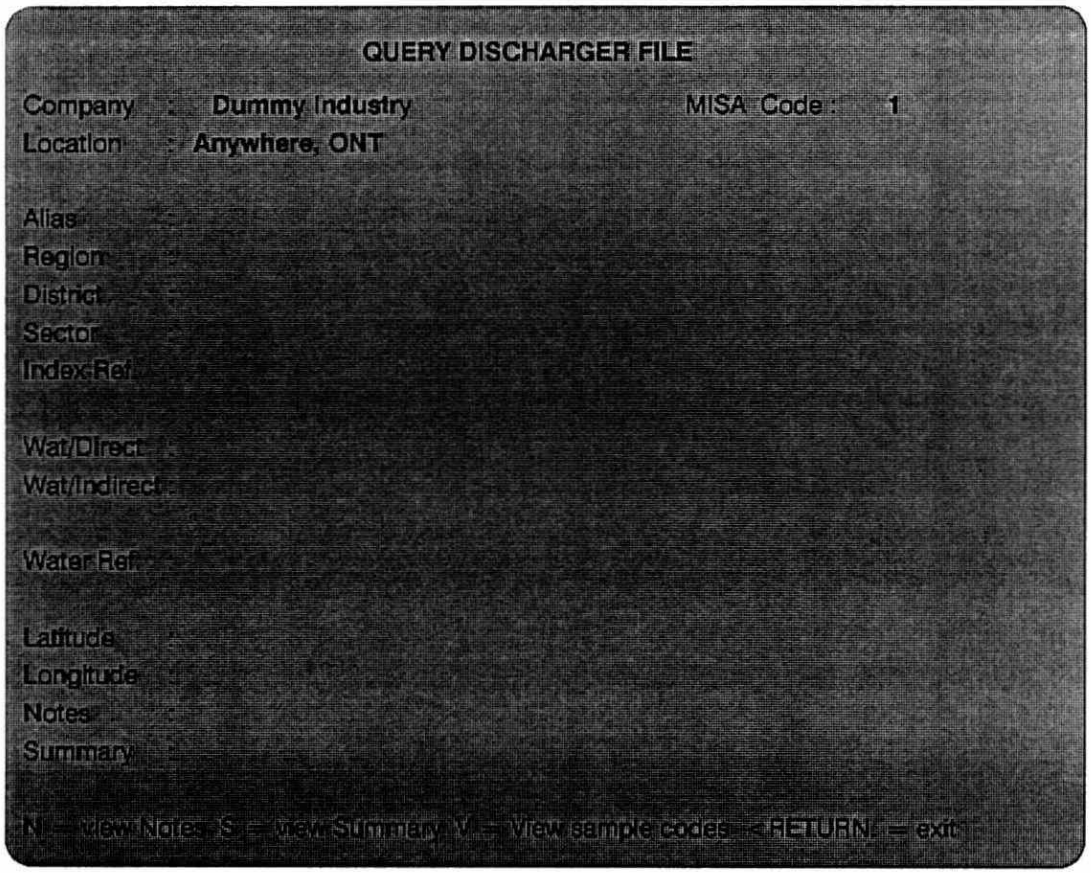


Figure 14: Query Discharger File screen

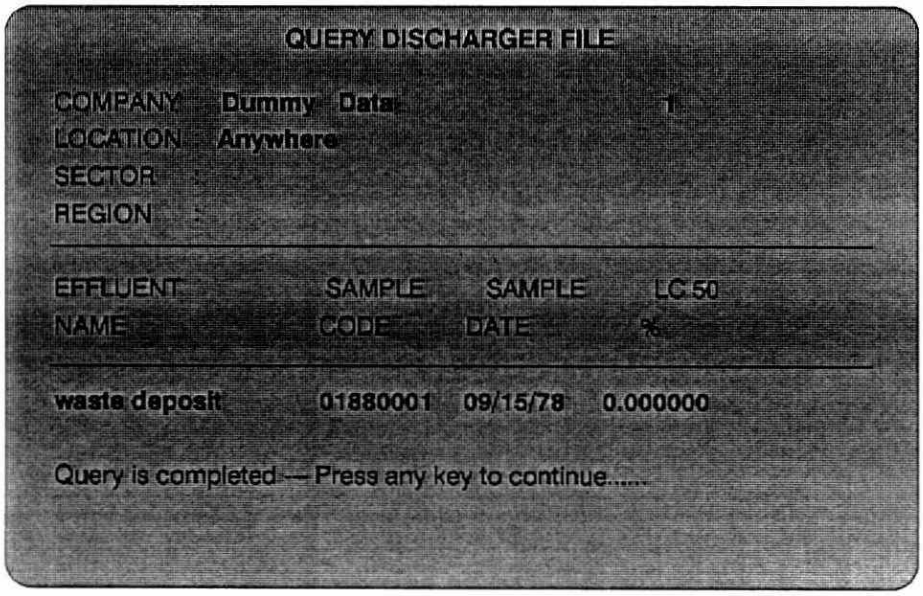


Figure 15: Query Discharger Samples

Finally, to exit the above screen, hit the **<ENTER>** key and then enter a "/" for the company name if you wish to return to the System Main Menu.

3.9 Query Pipe File

When wishing to view the **Pipe File** (option 9) you will be asked to enter the company name and location. After entering a valid name and location the user is asked to enter the control point (pipe code). If you are not sure of the control point (pipe code) you wish to view, you can enter a "/" to view all possible control points (pipe codes) for the company selected. After you type in the control point (pipe code), pipe name, and annual flow will appear on the screen and wait for you to hit any key.

To exit hit **<ENTER>** when asked to enter the control point (pipe code) and then a "/" when asked to enter the company name. This will take you back to the System Main Menu.

Note: Pipe File should contain **QTM** coordinates of location for all control points.

3.10 Query Sample File

Option **10** (Sample File) will allow the user to query information on a specific sample. By entering the company name/location and the control points (pipe code), the user will be able to select a sample code to view. Sample codes can be listed by entering a "/" in place of a valid sample code. To see detailed information on a sample just simply type in the sample code and hit **<ENTER>**.

```
                        QUERY SAMPLE FILE
Company      : Dummy Industry                  MISA Code:   1
Location     : Anywhere, ONT
Control pt.  : 1
Pipe Name    : waste deposit                   Annual Flow :      0.0000
-------------------------------------------------------------------------
Sample Code : 01880001                         Sample Ref   01880001
                                                    Test Code   : 1
LAB          : MOE                             No. Animals   10 :
Substance    :
Samp Meth    :
Coll. Name   : Mr. Smith
     Date Coll.        Date Rec.        Date Start          Time
     09/15/87          09/15/87         09/15/87            900
Ship Meth    :          Calc Meth   :    whatever
Storage      :          LC50        :    0.00000      Conc. Units : %
Preaerated   : F             Upper   :    0.00000      Dilution    :
Aerated      : T             Lower   :    0.00000
Lethal       : F             IntLow  :    0.00000
Slope        : 99.9          IntUpp  :    0.00000

Notes        : Junk record
-------------------------- *** Hit any key to continue *** --------------------------
```

Figure 16: Query Sample Screen

The information will appear on the screen and ask you to hit any key when ready to exit the screen (Figure 16).

To exit hit **<ENTER>** when asked to enter a sample code and also for the control point. Then enter a "/" to return to the System Main Menu.

3.11 Query Bucket File

By choosing option **11** (Bucket File) under the Query Menu the user can view information on a bucket for a specific sample. To view this information the user must first enter the company name and its location. The control point (pipe code) must be entered followed by the sample code. After this information has been entered a brief summary has been displayed on the screen and the user is prompted to enter in the bucket code to view. If you are not sure of what bucket code to enter you can enter a back-slash (/) to list all the existing bucket codes for the sample selected. By entering an existing bucket code you will be able to view the data on the screen, once finished you can continue by hitting any key (Figure 17).

To exit hit **<ENTER>** when asked to enter the bucket code. If you don not wish to query anymore buckets keep hitting **<ENTER>** until you are asked to enter in the company name and then enter a "/". The System Main Menu will then appear on the screen.

```
                        QUERY BUCKET FILE

Company   : Dummy Industry                          MISA Code : 1
Location  : Anywhere, ONT
Control pt : 1
Pipe Name : final effluent                  Annual Flow : 0.000
Sample    : 01880001
Lab       : MOE
Substance :
Date Coll : 09/15/87  Date Rec : 09/15/87  Date Start : 09/15/87  Time : 900

Bucket    : A
Concen.   : 100
LT50      : 0.000
.....ranupp : 0.000                  conupp : 0.000
.....ranlow : 0.000                  conlow : 0.000

Hit any key to continue.....
```

Figure 17: Query Bucket screen

3.12 Query Observation File

Option **12** (Query Observation File) will allow the user to query an observation for a sample. By typing in the company name, location, control point (pipe code), sample code and the bucket code there will be a prompt for the user to enter an observation date. The user can enter the date of "**MM**" (Mortality Matrix) or "**PP**" (Parameter Matrix). To view an observation type in the

observation date, enter the time of the observation (24 hr. format) and then enter one of your parameter codes from the parameter file. The value will then appear on the screen for the observation specified (if it already exists). Once the observation value has been displayed the user must hit any key in order to continue with the operation of the program.

To exit option 12 enter an "**XX**" when asked to enter the observation date, then hit **<ENTER>** three (3) times. Now enter a "/" to return to the system main menu.

```
                    QUERY OBSERVATION FILE

Company      : Dummy Industry                          MISA Code : 1
Location     : Anywhere, ONT
Control pt   : 1
Pipe Name    : final effluent                 Annual Flow : 0.000
Sample       : 01880001
Lab          : MOE
Substance    :
Date Coll    : 09/15/87  Date Rec : 09/15/87  Date Start : 09/15/87  Time : 900

Bucket       : A
Concen.      : 100
LT50         : 0.000
Observation Date : 09/15/87
           Time  : 900
Parameter Code   : 1 Mortality
Value            : 0.00000
Press any key to continue .....
```

Figure 18: Query Observation screen

3.13 Query Parameter File

By selecting option **13** (Query Parameter File) the user will be able to look up parameter codes and their units from the Parameter File. After selecting this option you will be asked to enter the parameter code. At this point you have three options -- (1) hit **<ENTER>** and exit; (2) enter a "/" to list all existing parameter codes; or (3) enter an existing parameter code to display data to the

```
                    QUERY PARAMETER FILE

Parameter Code
      1

Parameter Name                    Parameter Units
Mortality                         no. of dead


Hit any key to continue ....
```

Figure 19: Query Parameter screen

screen. The following screen will appear (Figure 19) and wait for you to hit any key. The screen will disappear and prompt you to enter a parameter code again (if you wish).

To exit hit <**ENTER**> when asked to enter the parameter code.

3.14 Query Test Code File

When wishing to query information on a particular test code, option **14** should be selected from the System Main Menu. After selecting this option the screen will clear itself and ask you to enter a test code. Two other options are available at this point -- (1) exit to the main menu; or (2) enter a "/" to list all the existing test codes. By typing in an existing test code, the information will appear on the screen (Figure 20). To exit this screen hit any key to return to the screen that asks you to enter a test code.

To exit, hit <**ENTER**> instead of entering a test code. This will bring you back to the system main menu.

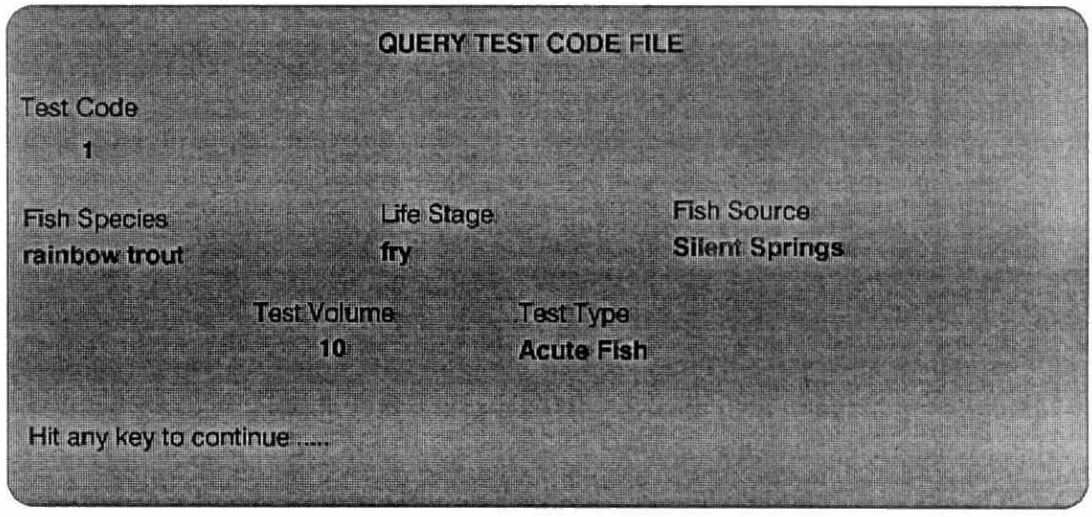


Figure 20: Query Test Code screen

3.15 Add/Modify Discharger File

Option **15** (Discharger File) will allow the user to add/modify the discharger information. The discharger file contains information about the companies. To add a company, simply enter a unique MISA code (up to 10 digits). You will be prompted to enter the information and after it has been entered you will autoimatically be put in the edit mode. To exit the edit mode hit <**ENTER**> and you will be able to enter a new MISA code if you so desire to. If not, exit the option. The same applies for the modification of a company. Enter the MISA code to edit any of the information for a particular company. If you are not sure of a company's MISA code you can list the companies on the screen by entering a "/". Next you will be asked to enter a letter to start listing the codes. This means that if the company's name starts wih a "**K**", you will type **K** and have the listing start with those beginning with the letter **K**. There is an example below (Figure 21). Once you have found the MISA code, enter the code and the information will appear on the screen, allowing you to edit or delete the information (Figure 22). Hit <**ENTER**> at this point if you wish to enter a new MISA code or exit the option (15) entirely.

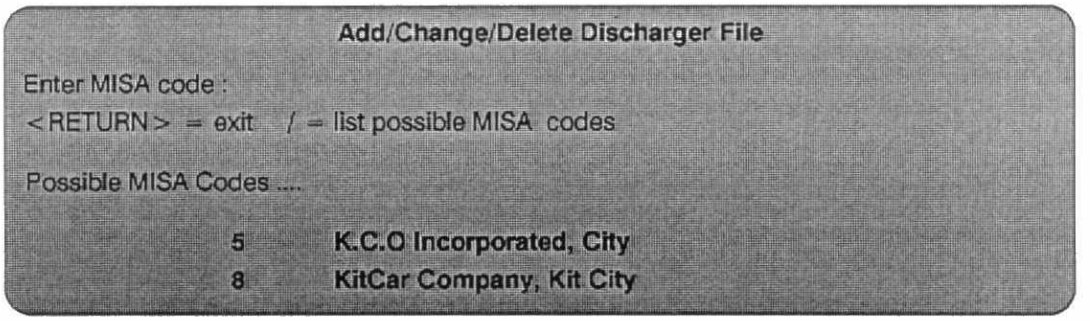

Add/Change/Delete Discharger File
Enter MISA code :
<RETURN> = exit / = list possible MISA codes
Possible MISA Codes ....
5 K.C.O Incorporated, City
8 KitCar Company, Kit City

Figure 21: Display IMIS Codes screen

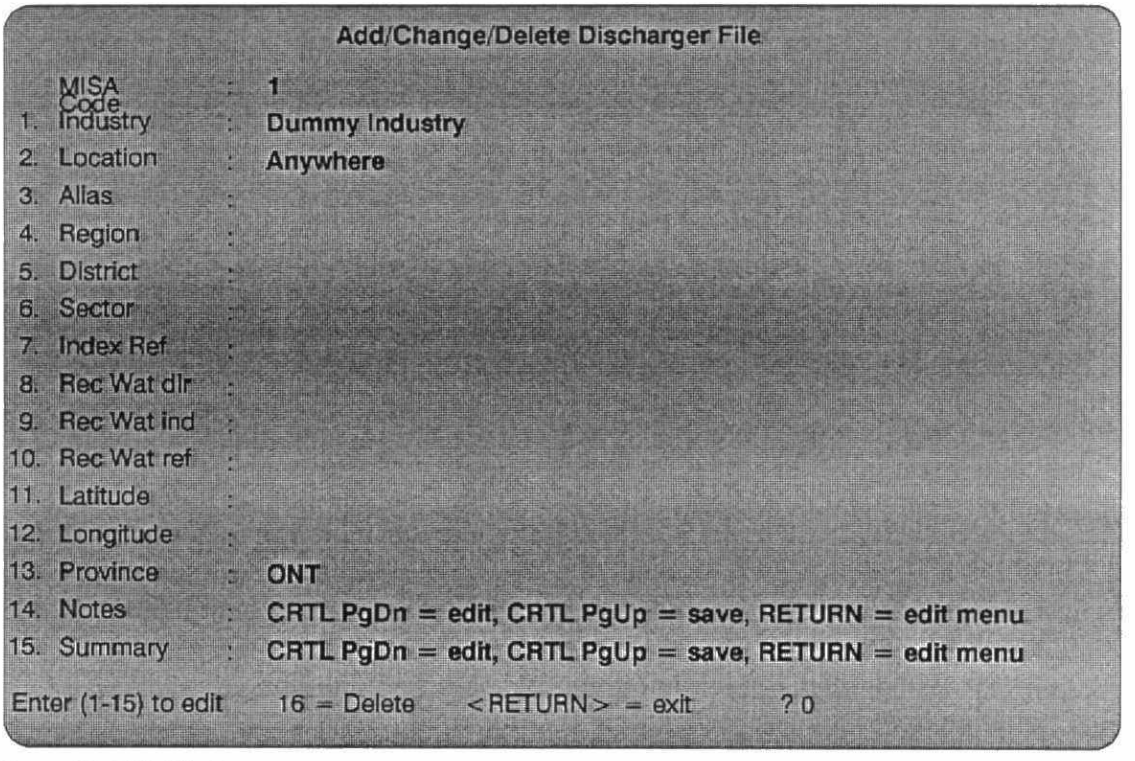

Add/Change/Delete Discharger File
MISA Code : 1
1. Industry : Dummy Industry
2. Location : Anywhere
3. Alias :
4. Region :
5. District :
6. Sector :
7. Index Ref :
8. Rec Wat dlr :
9. Rec Wat ind :
10. Rec Wat ref :
11. Latitude :
12. Longitude :
13. Province : ONT
14. Notes : CRTL PgDn = edit, CRTL PgUp = save, RETURN = edit menu
15. Summary : CRTL PgDn = edit, CRTL PgUp = save, RETURN = edit menu
Enter (1-15) to edit 16 = Delete <RETURN> = exit ? 0

Figure 22: Edit Discharger screen

To exit this option hit the **<ENTER>** key when asked to enter a MISA code. This will put you back into the System Main Menu.

3.16 Add/Modify Pipe File

This option allows the user to add/modify a control point (pipe code) to the Pipe File. You will first be asked for the company MISA code. Once this code has been entered, you will be prompted to enter the control point (pipe code). At this point you can enter a # to add/modify or you can enter a "/" to list all existing control points (pipe codes) for the selected company. If the control point (pipe code) you enter does not exist you will be automatically be put in the add mode. If the number already exists the data will be displayed on the screen and allow you to make any changes

necessary. If this program is to be used for MISA, the control points must be identical to Ministry assigned values.

To exit hit <**ENTER**> when asked to enter a control point (pipe code). This takes you back one step so that you can change the company (if you wish) or exit and return to the main menu. Hit <**ENTER**> now if you wish to exit.

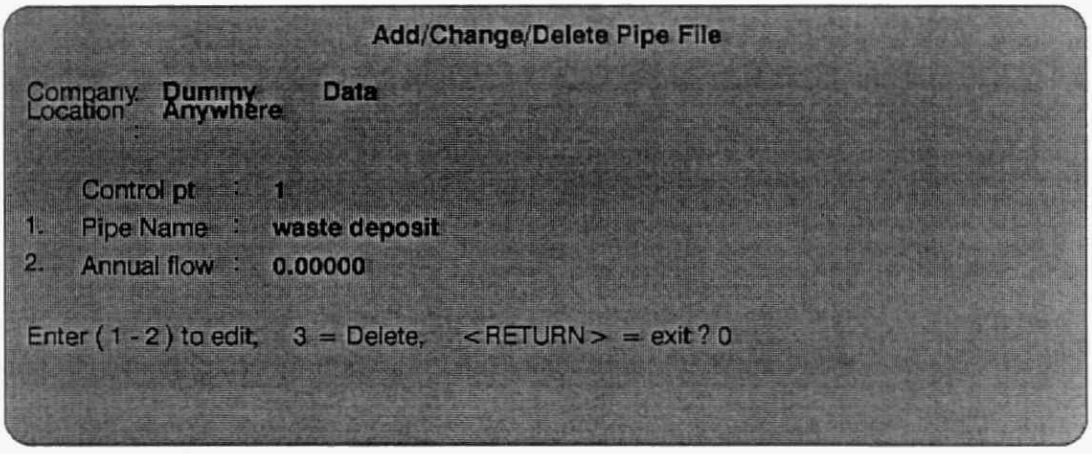

Add/Change/Delete Pipe File
Company: Dummy Data
Location: Anywhere
Control pt : 1
1. Pipe Name : waste deposit
2. Annual flow : 0.00000
Enter (1 - 2) to edit, 3 = Delete, <RETURN> = exit ? 0

Figure 23: Edit Pipe screen

3.17 Add/Modify Parameter File

Option **17** will allow the user to add/modify information in the Parameter File. By typing in a parameter code which is not on file you can add parameters to the database. If you enter a code which is already on file, it will be displayed on the screen and give you the opportunity to change the data. Hit <**ENTER**> to exit from the edit mode. This brings you back to the prompt to enter a parameter code. You can repeat this process for another parameter or exit to the main menu. If this program is to be used for MISA, the parameter code must be identical to Ministry assigned values (Appendix D).

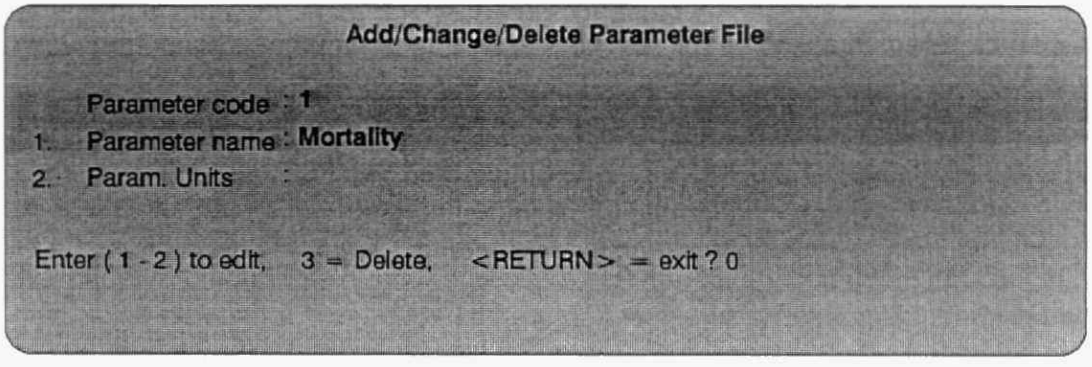

Add/Change/Delete Parameter File
Parameter code : 1
1. Parameter name : Mortality
2. Param. Units :
Enter (1 - 2) to edit, 3 = Delete, <RETURN> = exit ? 0

Figure 24: Edit Parameter screen

To exit hit <**ENTER**> when asked to enter a parameter code. The main menu will appear on the screen.

3.18 Add/Modify Test Code File

By selecting the option **18** from the main menu you will be allowed to add/modify test code information. After selecting this option you will be asked to enter a test code. By typing a number which does not already exist you can add a new test code to the file. If you enter a number that already exists you can modify information for the selected test code.

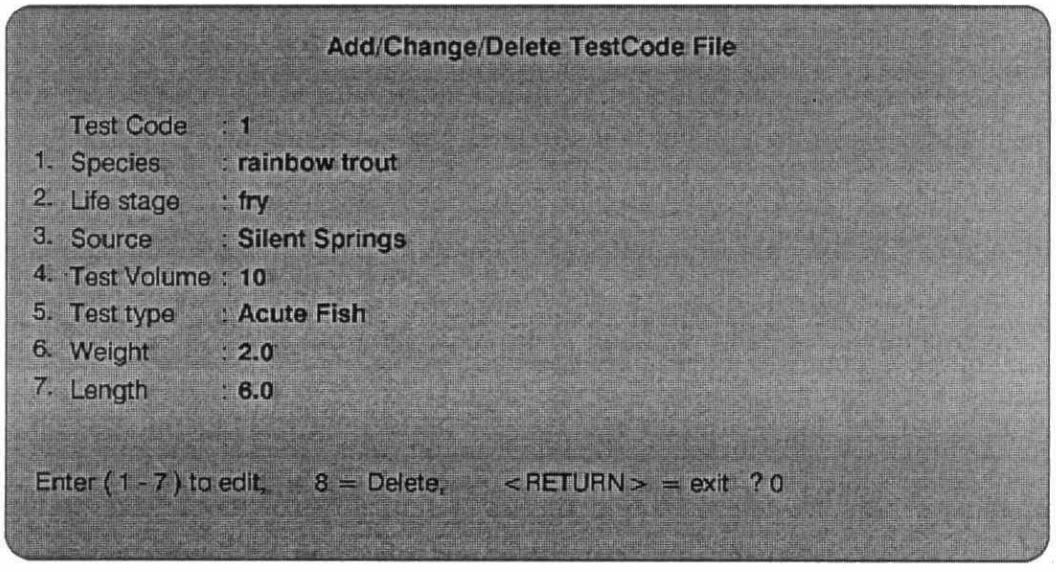

Add/Change/Delete TestCode File
Test Code : 1
1. Species : rainbow trout
2. Life stage : fry
3. Source : Silent Springs
4. Test Volume : 10
5. Test type : Acute Fish
6. Weight : 2.0
7. Length : 6.0
Enter (1 - 7) to edit, 8 = Delete, <RETURN> = exit ? 0

Figure 25: Edit Testcode screen

To exit hit <**ENTER**> when asked to enter a test code. This brings you back to the main menu. If this program is to be used for MISA, the testcode must be identical to Ministry assigned values (Appendix D).

3.19 Add/Modify Security File

Option **19** (Security File) allows the user (System Manager) to add/modify user information. After choosing this option you will have three different options to select from -- (1) exit to main menu; (2) view existing users; or (3) enter name to add/modify.

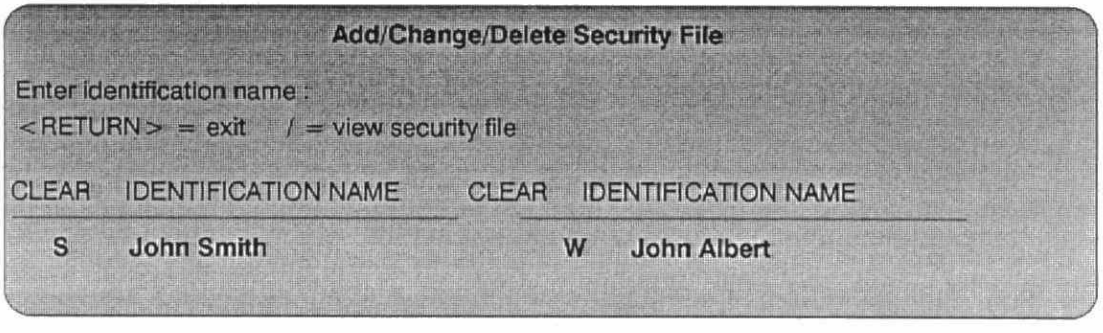

Add/Change/Delete Security File
Enter identification name :
<RETURN> = exit / = view security file
CLEAR IDENTIFICATION NAME CLEAR IDENTIFICATION NAME
S John Smith W John Albert

Figure 26: Display user status screen

If you choose to view the existing users, enter a "/". Figure 26 shows an example. This shows the users name and their clearance code.

By entering a user's name you can either add or modify information depending on whether or not

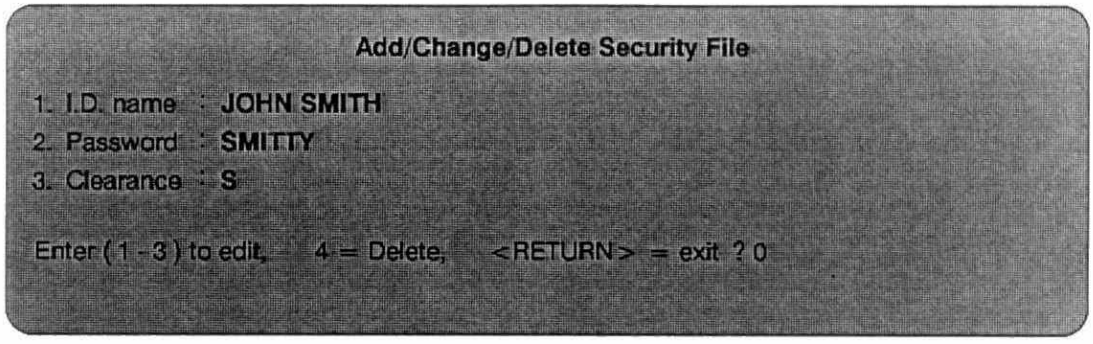


Figure 27: Edit Security File screen

the name exists in the Security File. If not, you can add a user. If it does exist you will be able to modify the information (Figure 27).

To exit back to the main menu, hit a <**ENTER**> when asked to enter an identification name.

3.20 Reindex Files

Option **20** (Reindex Files) allows the user to reindex the files of their chose. By selecting this option you can index one or all of the files. The following menu will appear on the screen. You will be asked to enter the starting #. This refers to which file you wish to start reindexing at. Now you will be asked to enter the ending #. This refers to which file you wish to stop reindexing at. An example is, if you wish to start at the Sample File enter **3** and if you wish to stop at the Security File enter **8**. This will reindex the Sample and Security Files and all the files which are listed between these two files.

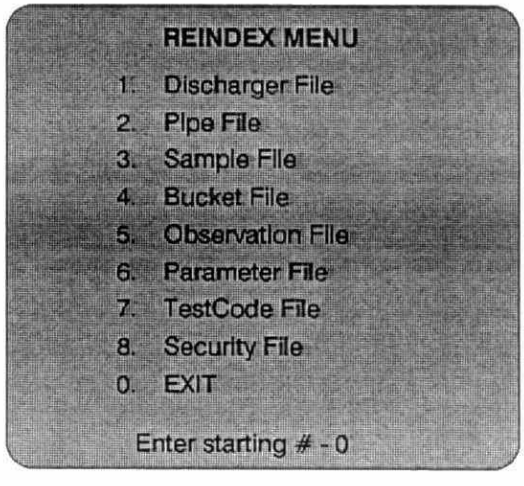


Figure 28: Reindex Menu

To exit, enter **zero** (0) when asked to enter the starting #. This brings you back to the main menu.

3.21 Sort Files

Option **21** (Sort Files) allows the user to sort the files. Figure 29 will appear on the screen after selecting the sort files option This works the same as the reindex option. Refer to the Reindex operation (3.20) description.

When sorting the files the reindex routine will run automatically after the last file has been sorted. This is done to restore the file indexes to match with the newly sorted files.

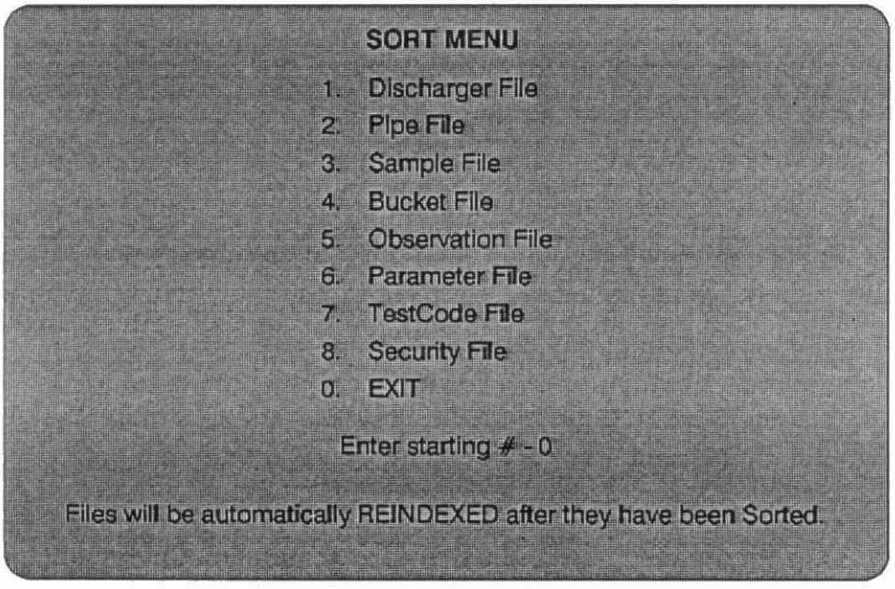


Figure 29: Sort Menu

3.22 Backup Files

Not implemented in Version 1.0.

3.23 Restore Files

Not implemented in Version 1.0.

3.24 Recall Deleted Records

Option **24** allows the user to recall any records that may have accidentally been marked for deletion. This option works the same as the reindex routine. Refer to section 3.20. This will perform a global search of the file and recall all records that have been marked for deletion.

3.25 Pack Deleted Records

Option **25** allows the user to Pack (delete) records that have been marked for deletion. Once these records have been packed you cannot recall them -- they must be reentered manually. This option also works the same as the reindex option discussed in section 3.20.

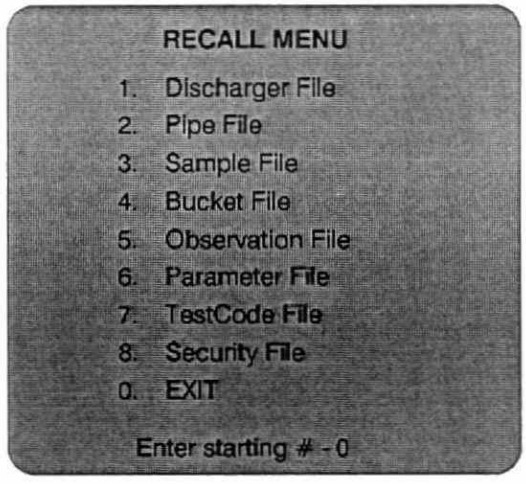


Figure 30: Recall Menu

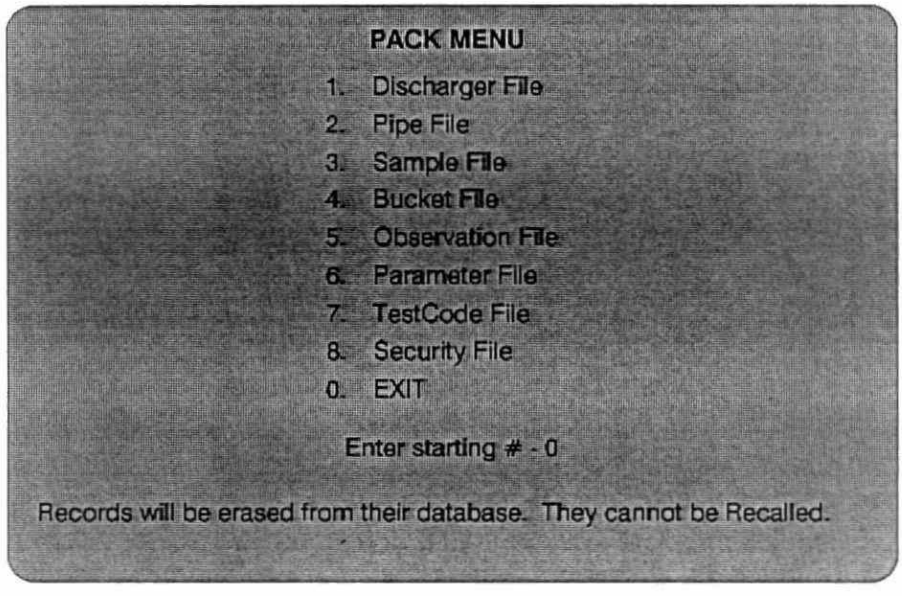


Figure 31: Pack Menu

3.26 Copy Samples from Disk

Option **26** allows the user to transfer Sample/Bucket/Observation data from floppy disk to the master databases. Records that are transfered to floppy disk using the File Dump can be copied to another system using this option. After selecting option 26 you will be asked if you wish to continue. Answer **Y** if you wish to transfer the records from floppy disk to the master databases. Answer **N** if you wish to return to the system main menu.

If you answered **Y** then you will be asked to place the floppy disk containing the files for downloading to the appropriate floppy disk (depends on how your system was set up). After you

have placed the disk into the appropriate drive, close the drive door and hit any key. The records will then start to be copied to the master databases.

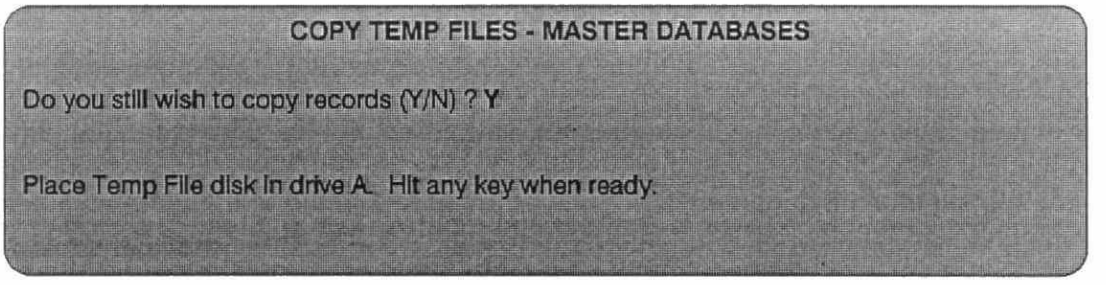

COPY TEMP FILES - MASTER DATABASES
Do you still wish to copy records (Y/N) ? Y
Place Temp File disk in drive A. Hit any key when ready.

Figure 32: Sample copy screen

APPENDIXES

APPENDIX A - DATABASE STRUCTURES

DISCHARGER FILE

Field Name	Type	Width	Dec
DISCHARGER	NUM	10	
INDUSTRY	CHR	35	
INDALIAS	CHR	35	
LOCATION	CHR	25	
REGION	CHR	25	
DISTRICT	CHR	25	
SECTOR	CHR	50	
INDXREF	CHR	10	
RECWATDR	CHR	64	
RECWATINDR	CHR	64	
RECWATXREF	CHR	10	
LAT	NUM	10	
LONG	NUM	10	
PROV	CHR	4	
NOTES	MEM	10	
SUMMARY	MEM	10	
*****TOTAL*****		**398**	

SECURITY FILE

PASSWORD	CHR	8	
CLEARANCE	CHR	1	
IDNAME	CHR	30	
*****TOTAL*****		**40**	

BUCKET FILE

SAMPLECODE	CHR	9	
BUCKETCODE	CHR	1	
CONCENTRAT	NUM	16	5
LT50	NUM	10	3
LT50RANUPP	NUM	10	3
LT50RANLOW	NUM	10	3
LT50CONUPP	NUM	10	3
LT50CONLOW	NUM	10	3
*****TOTAL*****		77	

PIPE FILE

Field Name	Type	Width	Dec
DISCHARGER	NUM	10	
PIPE	NUM	4	
PIPENAME	CHR	25	
ANNUALFLOW	NUM	16	3
*****TOTAL*****		**55**	

PARAMETER FILE

PARAMCODE	CHR	2	
PARAMNAME	CHR	35	
PARAMUNITS	CHR	25	
*****TOTAL*****		**63**	

TESTCODE FILE

TESTNUMBER	NUM	4	
FISHSPECIE	CHR	20	
LIFESTAGE	CHR	20	
FISHSOURCE	CHR	20	
TESTVOLUME	NUM	7	
TESTTYPE	CHR	10	
FISHWEIGHT	NUM	5	2
FISHLENGTH	NUM	5	2
*****TOTAL*****		**92**	

OBSERVATION FILE

BUCKETCODE	CHR	9	
OBSERVATIO	CHR	23	
OBSERVDATE	NUM	8	
OBSERVTIME	NUM	4	
PARAMCODE	NUM	2	
VALUE	NUM	16	5
*****TOTAL*****		**63**	

APPENDIX A - DATABASE STRUCTURES

SAMPLE FILE

Field Name	Type	Width	Dec
SAMPLE	CHR	8	
SAMPLEXREF	CHR	8	
PIPE	NUM	3	
DISCHARGER	NUM	10	
LAB	CHR	10	
SUBSTANCE	CHR	10	
SMPLMETHOD	CHR	25	
NAMECOLL	CHR	15	
DATECOLL	DATE	8	
DATEREC	DATE	8	
DATESTART	DATE	8	
TIME	NUM	4	
SHIPMETHOD	CHR	25	
STORAGE	CHR	15	
TESTCODE	NUM	4	
NOANIMALS	NUM	2	
PREAERATED	LOG	1	
AERATED	LOG	1	
CALCMETH	CHR	25	
LETHAL	LOG	1	
LC50	NUM	11	5
LC50UPPER	NUM	11	5
LC50LOWER	NUM	11	5
CONCUNITS	CHR	10	
NOTES	CHR	45	
LC50INTLOW	NUM	11	5
LC50INTUPP	NUM	11	5
DILUTION	CHR	15	
SLOPE	NUM	3	1
*****TOTAL*****		337	

APPENDIX B - FIELD DESCRIPTIONS

DISCHARGER FILE

- **DISCHARGER** - Refered to as the MISA Code. This is a UNIQUE number (10 digits max) used to identify the Company. Assigned by the Ministry of the Environment.
- **INDUSTRY** - This field is used to hold the name of the Company. A limit of 35 characters exists.
- **LOCATION** - This holds the location (city) of the Company. Maximum of 25 characters.
- **INDALIAS** - Used if the Company has changed its name. This field contains the Industries old name (35 characters max.).
- **REGION** - Each company is located in a specific region (max. of 25 characters). These regions are assigned by the Ministry of the Environment. There are six different regions: (1) Northwest; (2) Northeast; (3) Southwest; (4) Westcentral; (5) Central; and (6) Southeast.
- **DISTRICT** - The district field is assigned by the Ministry of the Environment. A maximm of 25 characters will be used.
- **SECTOR** - A 50 character field will be used to indicate the Industry catagory (by products). An example is -- Pulp and Paper.
- **INDEX REFERENCE** - Future use.
- **RECWATDR/RECWATINDR** - These fields refer to the receiving water course. Direct being a water source which has an effluent flowing directly into it. Indirect being a source of water which receives the effluent indirectly by means of a different water source.
- **RECWATXREF** - Future use.
- **LAT** - This stands for the Latitude location of the company. It is a number with a maximum of ten digits. Units (prob. radians).
- **LONG** - This stands for the Longitude location of the company. It is also a number 10 digits long.
- **PROV** - This field is used for the Province that the company is located in.
- **NOTES/SUMMARY** - These are memo fields that are used (by the Ministry of the Environment) for the overall perspective of toxicity for the site.

APPENDIX B - FIELD DESCRIPTIONS

PIPE FILE

- **DISCHARGER** - Reference to Discharger File.
- **PIPE** - Unique identifier assigned by the Ministry of the Environment for the control point. Must be numeric (max. of 3 digits).
- **PIPENAME** - Description of control point (effluent pipe). Max. of 25 characters.
- **ANNUALFLOW** - Represents the mean annual flow rate units.

SECURITY FILE

- **PASSWORD** - User's password. Any combination of eight characters.
- **CLEARANCE** - Security clearance code. There are three different types of clearances: (1) System Manager; (2) Write/Read; and (3) Read only.
- **IDNAME** - User's name. Used for security purposes.

PARAMETER FILE

- **PARAMCODE** - Unique code to identify a parameter.
- **PARAMNAME** - Description of the parameter. Examples: Mortality, Temperature, or Conductivity.
- **PARAMUNITS** - Units of measure for the parameter.

TESTCODE FILE

- **TESTNUMBER** - Unique code to identify the type of test.
- **FISHSPECIE** - The type of fish being used for the test.
- **LIFESTAGE** - The life stage of the fish at the time of the test.
- **FISHSOURCE** - Source of the fish.
- **TESTVOLUME** - The volume used for the test.
- **TESTTYPE** - Type of test being used.
- **FISHWEIGHT** - Represents the average weight of the fish.
- **FISHLENGTH** - Represents the average length of the fish.

APPENDIX B - FIELD DESCRIPTIONS

SAMPLE FILE

- **SAMPLE** - A unique code to represent a specific sample test. The first two characters will represent the LAB, the next two will represent the year of the test, and the last four digits will be numeric representing the number of the tests performed. An example is: **01881000**. The 01 stands for the Ministry of the Environment, the 88 stands for the year 1988, and the 1000 stands for the one thousandth test of the 1988 year.
- **SAMPLEXREF** - Future use.
- **PIPE** - Reference to Pipe File.
- **DISCHARGER** - Reference to Discharger File.
- **LAB** - Laboratory that the sample was tested at.
- **SUBSTANCE** - Substance being tested.
- **SMPLMETHOD** - The sample menthod being used for the test.
- **NAMECOLL** - The name of the person who collected the sample.
- **DATECOLL** - The date that the sample was collected (MM/DD/YY).
- **DATEREC** - The date that the sample was received (MM/DD/YY).
- **DATESTART** - The date the sample test was started (MM/DD/YY).
- **TIME** - The time that the test was started (24 hour format).
- **SHIPMETHOD** - How the sample was shipped to the lab.
- **STORAGE** - The type of storage used for the sample.
- **TESTCODE** - Reference to the Testcode File.
- **NOANIMALS** - The number of animals used per bucket, per concentration.
- **PREAERATED** - True or false. Sample was aerated prior to test.
- **AERATED** - True or false. Aerated during test.
- **CALCMETH** - Statistical method used to calculate the LC50..
- **LETHAL** - True or false. If lethality occurred as a result of exposure.
- **LC50** - The lethal concentration which will cause 50% mortality.
- **LC50UPPER** - Upper 95% confidence limit.

APPENDIX B - FIELD DESCRIPTIONS

- **LC50LOWER** - Lower 95% confidence limit.
- **CONCUNITS** - Unit of measurement for LC50.
- **NOTES** - Problems or comments concerning collection or experimentation.
- **LC50INTLOW** - Upper limit if LC50 cannot be found.
- **LC50INTUPP** - Lower limit if LC50 cannot be found.
- **DILUTION** - Source of water used as the test dilution water.

BUCKET FILE

- **SAMPLECODE** - Combination of sample code plus bucket code.
- **BUCKETCODE** - Used to identify a bucket.
- **CONCENTRAT** - Concentration of sample in a bucket.
- **LT50** - The response time to kill 50% of the fish.
- **LT50RANUPP** - Upper 95% confidence limit.
- **LT50RANLOW** - Lower 95% confidence limit.
- **LT50CONUPP** - Upper limit if LT50 cannot be found.
- **LT50CONLOW** - Lower limit if LT50 cannot be found.

OBSERVATION FILE

- **BUCKETCODE** - Combination of sample code plus bucket code.
- **OBSERVATIO** - Combintion of sample code, bucket code, observation date, observation time, and the parameter code.
- **OBSERVDATE** - Date the observation was taken.
- **OBSERVTIME** - Time of the observation.
- **PARAMCODE** - Reference to Parameter File.
- ** **VALUE** - Value of the observation for the parameter selected.
- **SLOPE** - The slope of the toxicity curve.

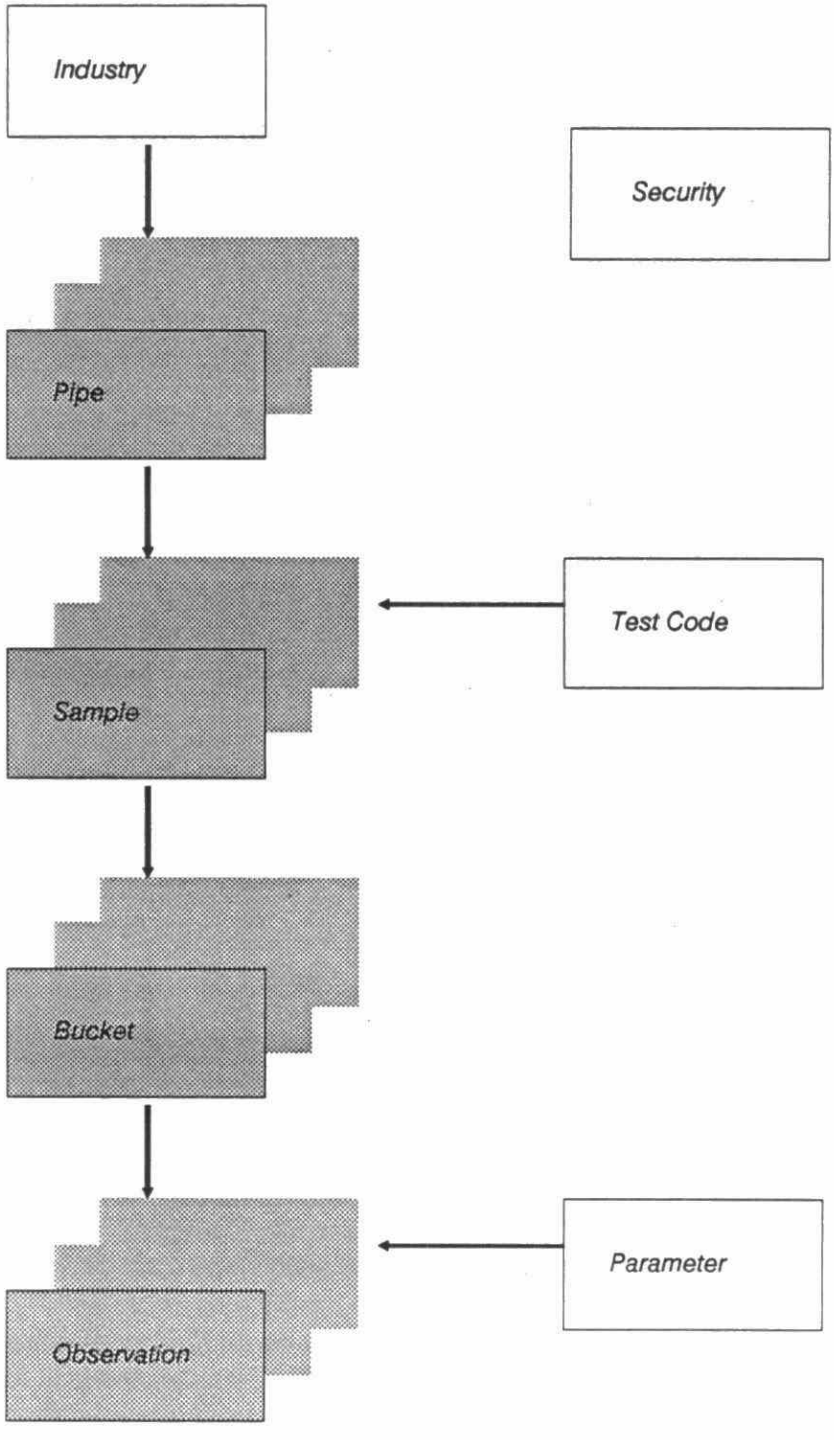
** Parameters: pH, conductivity, dissolved oxygen and temperature must be measured for all effluent concentrations and control at the start and end of the bioassy. Apply to fish and daphnia bioassy.

** Parameter: mortality must be measured at the following time intervals - 0, 1hr, 2hr, 4hr, 24hr, 48hr, 72hr, and 96hr - for the trout bioassy. The mortality must be measured at the following time intervals - 0, and 48hr - for the daphnia bioassy.

NOTE: All field names which are underlined **must** be entered for the transfering of data to floppy disk. These values are required by the MISA Regulations.

Appendix C - Database Relationships

DIAGRAM OF HOW THE TOXDATA DATABASES ARE RELATED



Appendix D - Contents of Parameter and Testcode Files

Enter the following information into the Parameter database:

Parameter File

Record no.	Parameter Code	Parameter Name	Parameter Units
1	1	Mortality	number of dead
2	2	pH	1-14
3	3	Dissolved oxygen	ppm
4	4	Conductivity	mmhos
5	5	Temperature	degrees celcius

Enter the following information into the Testcode database:

Testcode File

Field names	Record no. 1	Record no. 2
TESTNUMBER	1	2
FISHSPECIE	Salmo gairdneri	Daphnia magna
LIFESTAGE	fry	1st instar
FISHSOURCE		
TESTVOLUME		
TESTTYPE	Acute/static	Acute/static
FISHWEIGHT		
FISHLENGTH		

APPENDIX E - SAMPLE REPORTS AND PRINTOUTS

Ministry of the Environment
Water Resources Branch
Aquatic Toxicity Unit

Page 1

TOXICITY TEST REPORT

TEST CONDITIONS

Sample Name: 01880001

Test Number: 1

Company	:	Dummy Industry (1) Anywhere, ONT.
Region	:	
Sample Site	:	final, (1)
Lab used	:	MOE
Sampling Method	:	grab
Sampled By	:	J. Doe
Date Collected	:	11/16/87
Received	:	11/16/87
Tested	:	11/16/87
Time	:	945
Type of Bioassay	:	STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Species	:	rainbow trout
Weight (gm)	:	
Length (mm)	:	

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 01:25	03:55	24:55	48:00	73:00	96:00	TOTAL MORTALITY %
100	0	2	0	0	2	2	60
65	0	1	0	0	1	1	30
40	0	0	2	0	0	0	20
30	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50	95% Confidence Limits	
	Upper	Lower
51.00000	55.00000	35.00000

...2

APPENDIX E - SAMPLE REPORTS AND PRINTOUTS

Slope : Page 2
Method of calculation

TOXICITY TEST REPORT

Sample Name: 01880001 Test Number: 1

TEST CONC. %		ELAPSED TIME 01:25	03:55	24:55	48:00	73:00	96:00
100	pH	3.0	3.0	3.0	3.0	3.0	3.0
	O2 ppm	5.0	5.0	5.0	5.0	5.0	5.0
	Cond.	1065	1065	1065	1065	1065	1065
	Temp (C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH	4.0	4.0	4.0	4.0	4.0	4.0
	O2 ppm	4.0	4.0	4.0	4.0	4.0	4.0
	Cond.	1000	1000	1000	1000	1000	1000
	Temp (C)	15.0	15.0	15.0	15.0	15.0	15.0
40	pH	5.0	5.0	5.0	5.0	5.0	5.0
	O2 ppm	6.0	6.0	6.0	6.0	6.0	6.0
	Cond.	600	600	600	600	600	600
	Temp (C)	15.0	15.0	15.0	15.0	15.0	15.0
30	pH	7.0	7.0	7.0	7.0	7.0	7.0
	O2 ppm	3.0	3.0	3.0	3.0	3.0	3.0
	Cond.	450	450	450	450	450	450
	Temp (C)	15.0	15.0	15.0	15.0	15.0	15.0
10	pH	9.0	9.0	9.0	9.0	9.0	9.0
	O2 ppm	3.0	3.0	3.0	3.0	3.0	3.0
	Cond.	290	290	290	290	290	290
	Temp (C)	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH	8.0	8.0	8.0	8.0	8.0	8.0
	O2 ppm	7.0	7.0	7.0	7.0	7.0	7.0
	Cond.	250	250	250	250	250	250
	Temp (C)	15.0	15.0	15.0	15.0	15.0	15.0

Tested by : _____

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APPENDIX E - SAMPLE REPORTS AND PRINTOUTS

COMPANY : Dummy Industry, Anywhere
SECTOR : Pulp and Paper
REGION : central

SUMMARY

EFFLUENT	SAMPLE CODE	SAMPLE DATE	LC50 %	COMMENTS
final	01870010	11/16/87	51.0	junk record
	01870100	05/25/87	100.0	junk record
	01871000	01/19/87	100.0	junk record

Entire Sample File Dump

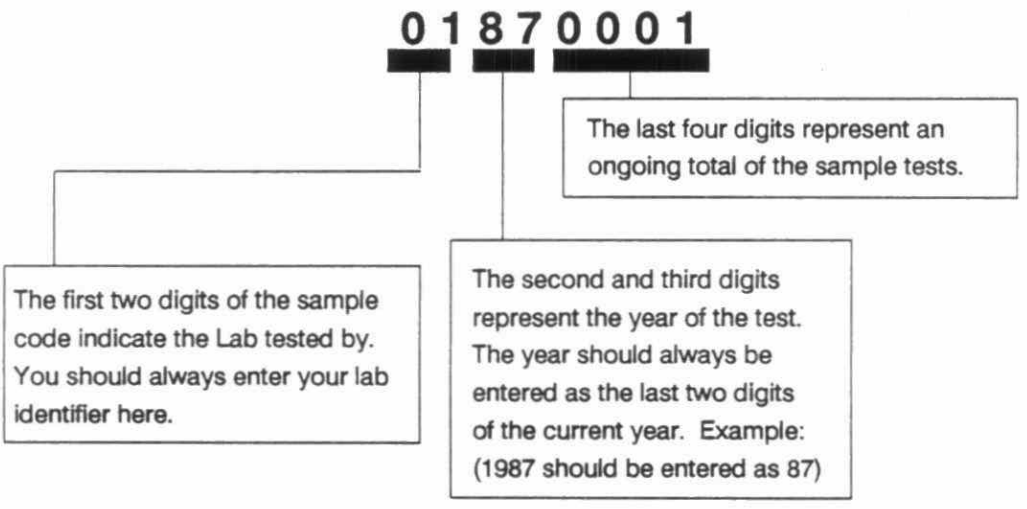
```
*** Log Recording Print Out ***
JOHN SMITH logged on at  10:07:44 on  01/04/88

Added a Pipe...
Dummy Industry, Anywhere
Pipe #   3
Effluent   - waste disposal
Ann flow -

REINDEXED SAMPLE FILE
REINDEXED BUCKET FILE
REINDEXED OBSERVATION FILE

Renamed LOGFILE.TXT to zz1.LOG.

JOHN SMITH logged off at  15:27:59 on  01/04/88
*** End of Log Recording Print Out ***
```

Printout of a user's logfile.

APPENDIX F - SAMPLE CODE ASSIGNMENT

The sample code, for the MISA progrm, consists of eight digits which are divided up into three different sections. These sections are the (1) lab identifier; (2) year of test; and (3) number of the sample.

The sample code must contain only numeric digits. Leading zeros must be entered.


0 1 8 7 0 0 0 1
The last four digits represent an ongoing total of the sample tests.
The first two digits of the sample code indicate the Lab tested by. You should always enter your lab identifier here.
The second and third digits represent the year of the test. The year should always be entered as the last two digits of the current year. Example: (1987 should be entered as 87)

Contact the Aquatic Toxicty Unit (416) 235-5792 at the Ministry of Environment to receive your lab identifier.